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THE MINERAL INDUSTRY OF PENNSYLVANIA IN 1974

William Kebblish

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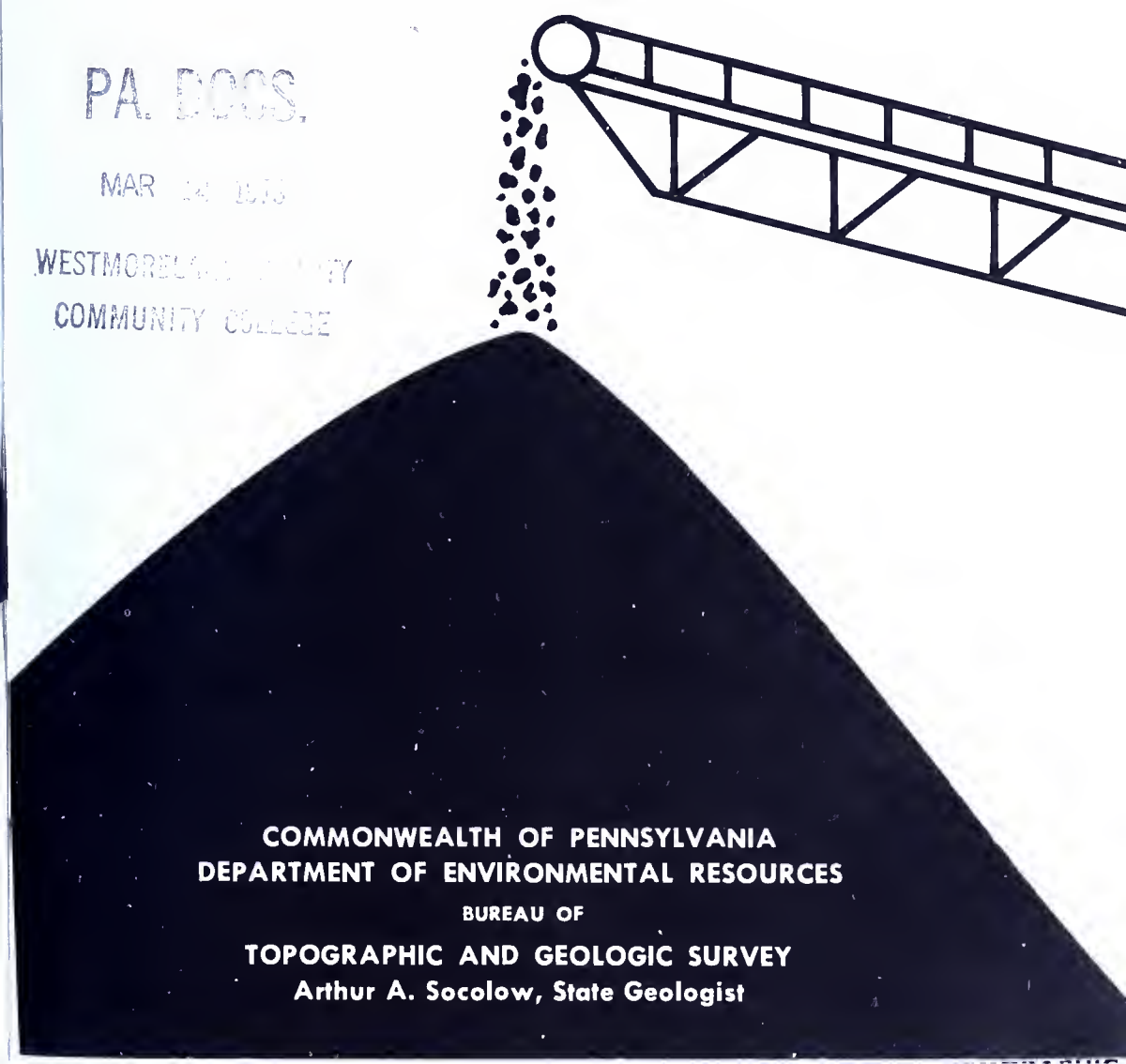
WESTMORELAND COUNTY
COMMUNITY COLLEGE



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF
TOPOGRAPHIC AND GEOLOGIC SURVEY
Arthur A. Socolow, State Geologist

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The Mineral Industry of Pennsylvania

This chapter has been prepared by the Bureau of Mines, U.S. Department of the Interior, and the Pennsylvania Bureau of Topographic and Geologic Survey, Department of Environmental Resources, under a cooperative agreement for collecting information covering the mineral production from mines, quarries, and wells.

By William Kebblish [1]

Pennsylvania's mineral production reached a record output value of $2,374 million, $973 million above that of 1973. Compared with 1973, increases in value were attained by nearly all commodities except clays, which declined slightly. The major increases in value were due to the more than doubling of fuel prices. Solid fuel output represented 75% of the total State mineral production value; output of all fossil fuels equaled 78% of the total.

The following counties, Greene, Clearfield, Armstrong, Somerset, and Northampton, were the leading mineral producers; their combined output was 28.7% of the total value.

Pennsylvania continued to lead the Nation in output of stone and anthracite coal, ranked second in lime output, third in shipments of portland cement, and was the third largest coal producing state.

[1] State Liaison Officer, Bureau of Mines, Harrisburg, Pa.

Table 1.—Mineral production in Pennsylvania [1]

Mineral	1973 Quantity	1973 Value (thousands)	1974 Quantity	1974 Value (thousands)
Cement:				
Masonry thousand short tons	490	$14,443	404	$14,642
Portland do	8,563	171,653	7,448	191,594
Clays [2] do	2,975	16,664	2,732	16,496
Coal:				
Anthracite do	6,830	90,260	6,617	144,695
Bituminous do	76,403	786,792	80,462	1,637,394
Copper (recoverable content of ores, etc.) short tons	1,845	2,195	--	--
Gem stones	NA	9	NA	9
Lime thousand short tons	2,260	40,949	2,080	50,147
Natural gas million cubic feet	78,514	32,976	82,637	36,360
Peat thousand short tons	28	411	30	515
Petroleum (crude) thousand 42-gallon barrels	3,282	18,440	3,478	36,220
Sand and gravel thousand short tons	20,576	42,830	18,071	45,181
Stone do	78,564	150,346	73,092	159,615
Zinc (recoverable content of ores, etc.) short tons	18,857	7,792	20,288	14,567
Value of items that cannot be disclosed:				
Clay (kaolin), iron ore, natural gas liquids, tripoli	XX	26,140	XX	26,983
Total	XX	1,401,900	XX	2,374,418
Total 1967 constant dollars	XX	1,027,733	XX	p1,135,492

p Preliminary. NA Not available. XX Not applicable.

[1] Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2] Excludes kaolin; included with "Value of items that cannot be disclosed."

Table 2.—Value of mineral production in Pennsylvania, by county [1] [2]

(Thousands)

County	1973	1974	Minerals produced in 1974 in order of value
Adams	W	$14,488	Stone, lime, clays.
Allegheny	$69,481	92,741	Coal, cement, petroleum, stone, clays, sand and gravel, natural gas liquids.
Armstrong	59,184	115,804	Coal, sand and gravel, clays, stone, petroleum.
Beaver	W	W	Coal, sand and gravel, clays, petroleum.
Bedford	1,862	2,663	Stone, coal, sand and gravel.
Berks	40,951	47,274	Iron ore, cement, stone, clays, sand and gravel.
Blair	W	3,569	Stone, sand and gravel, clays.
Bradford	W	W	Sand and gravel.
Bucks	17,471	19,293	Stone, sand and gravel, clays.
Butler	W	48,061	Coal, cement, stone, lime, petroleum, sand and gravel, clays.
Cambria	W	W	Coal, stone.
Carbon	3,492	6,825	Coal, sand and gravel, stone.
Centre	W	W	Coal, lime, stone.
Chester	W	13,777	Stone, lime, clays.
Clarion	37,481	96,284	Coal, stone, petroleum, clays, sand and gravel.
Clearfield	57,277	147,144	Coal, clays.
Clinton	W	11,011	Coal, stone, clays.
Columbia	W	1,780	Coal, stone, sand and gravel.
Crawford	1,339	W	Sand and gravel, petroleum.
Cumberland	4,255	4,460	Stone, sand and gravel, clays.
Dauphin	W	5,007	Stone, coal, sand and gravel.
Delaware	W	W	Stone.
Elk	W	W	Coal, petroleum, sand and gravel, natural gas liquids, stone.
Erie	2,146	W	Sand and gravel, peat, petroleum.
Fayette	22,712	56,523	Coal, stone, clays, petroleum.
Forest	W	W	Petroleum, sand and gravel.
Franklin	W	W	Stone, sand and gravel.
Fulton	W	W	Do.
Greene	112,527	206,949	Coal, petroleum.
Huntingdon	W	7,599	Sand and gravel, stone, clays, coal.
Indiana	88,032	W	Coal, stone.
Jefferson	W	W	Coal, clay, stone, petroleum.
Juniata	432	--	
Lackawanna	W	W	Coal, stone, peat.
Lancaster	14,843	13,021	Stone, sand and gravel, clays.
Lawrence	W	43,914	Cement, coal, stone, sand and gravel, clays, peat.
Lebanon	W	W	Lime, stone.
Lehigh	W	44,354	Cement, zinc, stone.
Luzerne	32,922	42,709	Coal, stone, sand and gravel, clays, peat.
Lycoming	5,015	8,455	Coal, stone, sand and gravel, tripoli.
McKean	W	W	Petroleum, clay, stone.
Mercer	W	W	Coal, sand and gravel, stone, petroleum.
Mifflin	W	834	Stone, sand and gravel, lime.
Monroe	2,359	2,285	Stone, sand and gravel, clays, peat.
Montgomery	W	24,314	Stone, cement, lime, clays.
Montour	W	W	Stone.
Northampton	W	101,468	Cement, stone, sand and gravel.
Northumberland	95,514	23,782	Coal, stone, sand and gravel, clays.
Perry	W	W	Sand and gravel, stone.
Pike	518	795	Sand and gravel, stone.
Potter	W	252	Petroleum, sand and gravel, stone.
Schuylkill	W	W	Coal, stone, sand and gravel.
Snyder	W	W	Stone.
Somerset	42,296	112,149	Coal, stone, clays, sand and gravel.
Sullivan	381	W	Coal.
Susquehanna	739	999	Stone, coal.
Tioga	3,130	W	Coal, sand and gravel, stone.
Union	W	W	Stone, clays.
Venango	W	W	Coal, petroleum, sand and gravel, natural gas liquids.
Warren	3,430	W	Petroleum, sand and gravel, natural gas liquids.
Washington	W	W	Coal, petroleum, clays.
Wayne	W	W	Stone, sand and gravel, peat.
Westmoreland	W	58,744	Coal, stone, sand and gravel.
Wyoming	W	1,950	Sand and gravel.
York	31,305	34,288	Cement, stone, lime, clays, sand and gravel.
Undistributed [3]	650,804	958,853	
Total [4]	1,401,900	2,374,418	

W Withheld to avoid disclosing individual company confidential data; included with "Undistributed."

[1] Cameron and Philadelphia Counties are not listed because no production was reported.

[2] Value of petroleum is based on an average price per barrel for the State.

[3] Includes some stone (1973), coal (1974), and petroleum that cannot be assigned to specific counties, natural gas, gem stones, and values indicated by symbol W.

[4] Data may not add to totals shown because of independent rounding.

Table 3.—Indicators of Pennsylvania business activity

		1973	1974 [p]	Change, percent
Employment and labor force, annual average:				
Total labor force	thousands	5,010.2	NA	NA
Unemployment	do	242.2	NA	NA
Employment (nonagricultural):				
Manufacturing	do	1,473.7	1,466.6	−.5
Construction	do	209.4	209.7	+.1
Mining	do	39.8	42.2	+6.0
Transportation and public utilities	do	265.5	265.8	+.1
Wholesale and retail trade	do	894.9	896.3	+.2
Finance, insurance, real estate	do	206.3	209.5	+1.6
Services	do	741.2	761.7	+2.8
Government	do	658.1	673.7	+2.4
Personal income:				
Total	millions	$59,427	$64,976	+9.3
Per capita		$5,010	$5,490	+9.6
Construction activity:				
Value of authorized nonresidential construction	millions	$575.9	$514.4	−10.7
Number of new residential units authorized		59,670	38,821	−34.9
Cement shipments to and within Pennsylvania	thousand short tons	3,658	3,350	−8.4
Mineral production value	millions	$1,401.9	$2,374.4	+69.4

[p] Preliminary. NA Not available.

Sources: Survey of Current Business; Employment and Earnings; Construction Review; Area Trends in Employment and Unemployment; U.S. Bureau of Mines.

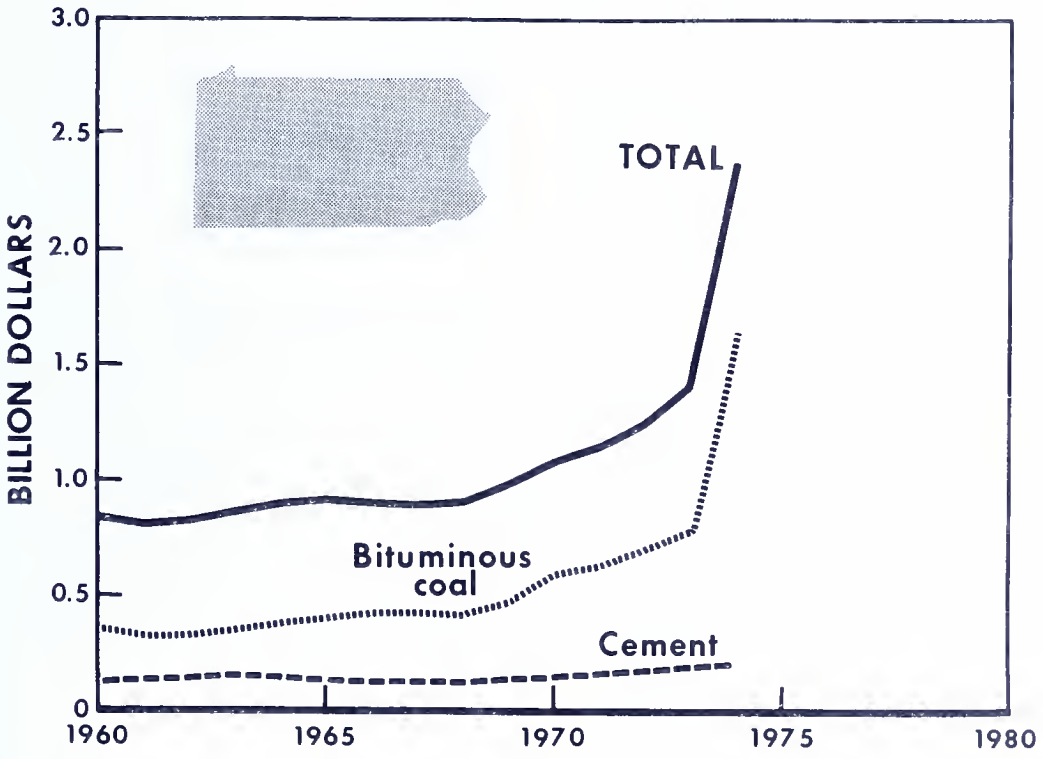

Figure 1.—Value of bituminous coal, cement, and total value of mineral production in Pennsylvania.

Legislation and Government Programs.—Legislation of interest to the mineral industry passed by the General Assembly and signed into law during 1974 comprised the following:

Act 186, "Tax Reform Code of 1971," provides the mechanism through which salvage and recycling plant equipment may receive tax exemption.

Act 198, establishing the Pennsylvania Solid Waste-Resource Recovery Development Fund to provide loans for development of large-scale resource recovery centers to serve communities.

Acts 208 and 288, which amend the "Pennsylvania Sewage Facilities Act" to provide for the planning and regulation of individual as well as community sewage systems and to provide for certification of all sewage enforcement officers by March 15, 1975. The act also eliminates certain restrictions on the Environmental Quality Board and provides appropriations to the Department of Environmental Resources (DER) for erosion control of Presque Isle State Park.

Act 311, amending the "Pennsylvania Bituminous Coal Mine Act," to provide for certification and use of noncertified persons under certain temporary conditions in underground coal mines.

Act 319, pertained to procedures under which an owner may have land devoted to agricultural use, agricultural reserve use, or forest reserve use, valued for tax purposes and provided for reassessment and certain interest payments when such land is applied to other uses.

In June the Governor signed bills giving $50,000 to the Governor's Energy Council for use in the last half of the year and $280,000 to the Community Affairs Office for its fuel allocation system.

The Land and Water Conservation and Reclamation Act, sometimes known as "The Bond Issue," "Project 500," or "Operation Scarlift," provided for the expenditure of $200 million over a 10-year period for mine area restoration. The seventh year of this 10-year program was completed on June 30, 1974; stream pollution abatement received $150 million, air pollution control (burning banks) $20 million, and extinguishment of underground mine fires and mine subsidence control $30 million.

During the 7½-year period ending December 31, 1974, 320 projects were completed at a cost in excess of $44 million, 204 projects were for stream pollution abatement, 54 for mine subsidence, 44 for underground mine fires, and 18 for air pollution abatement as shown in table 4.

During the last 4 years, 1971-74, 90 stream pollution abatement projects costing in excess of $16 million were completed; 8 air pollution projects were completed in excess of $3.5 million; 18 mine fires, at a cost of $8.7 million; and 32 mine subsidence projects, for a total of $2.0 million as shown in table 5. Of the total, 34 projects costing over $14 million were completed in calendar year 1974; 8 of these projects were in the anthracite region, and 26 were in the bituminous area as shown in table 6.

The Pennsylvania State University (PSU) under a $24,999 contract from the Federal Bureau of Mines conducted a study for recommending Government policies that would encourage private investment as a way to increase production in the domestic iron and steel industry.

The Federal Highway Administration (FHA) reported in late August that all but 123 miles of the 1,567 miles of Pennsylvania Interstate Highway System was open to traffic. The incomplete 123 miles comprised 72 miles under construction and 51 miles in the engineering and preliminary status stages.

Table 4.—Pennsylvania: Project 500 (Operation Scarlift) contracts completed (June 30, 1967 to December 31, 1974)

Project	Anthracite		Bituminous		Total	
	Number	Cost	Number	Cost	Number	Cost
Stream pollution abatement	35	$7,583,681.81	169	$19,577,097.67	204	$27,160,779.48
Air pollution abatement	10	12,197,938.54	8	181,011.96	18	12,378,950.50
Underground mine fires	5	86,430.38	30	1,068,190.10	35	1,154,620.48
	3	[1]514,200.00	6	[1]100,952.19	9	[1]615,152.19
Prevention of mine subsidence	13	1,103,649.02	41	1,929,051.27	54	3,032,700.29
Total	66	21,485,899.75	254	22,856,303.19	320	44,342,202.94

[1] State Share Appalachian Agreements.

Source: Bond Issue Report December 1974, p. 104.

Table 5.—Pennsylvania: Project 500 (Operation Scarlift) contracts completed 1971–74

Project	1971		1972		1973		1974		Total	
	Number	Cost	Number	Cost	Number	Cost	Number	Cost	Number	Cost
Stream pollution abatement	30	$3,793,985	7	$1,232,209	27	$5,363,745	26	$6,196,634	90	$16,586,573
Air pollution abatement	3	19,350	3	2,678,314	1	182,972	1	648,220	8	3,528,856
Underground mine fires	6	451,158	5	195,114	4	75,461	3	7,947,832	18	8,669,565
Prevention of mine subsidence	5	627,507	13	553,801	10	776,372	4	44,197	32	2,001,877
Total	44	4,892,000	28	4,659,438	42	6,398,550	34	14,836,883	148	30,786,871

Source: Department of Environmental Resources 1974 Annual Report.

Table 6.—Pennsylvania: Operation Scarlift cost data 1974

Project	Contracts and agreements awarded or approved in 1974						Construction projects completed in 1974					
	Anthracite	Cost	Bituminous	Cost	Total Number	Total Cost	Anthracite	Cost	Bituminous	Cost	Total Number	Total Cost
Stream pollution abatement	3	$649,343	10	$793,795	13	$1,443,138	4	$2,030,014	22	$4,166,620	26	$6,196,634
Air pollution	--	--	--	--	--	--	1	648,220	--	--	1	648,220
Underground mine fires	--	--	2	104,449	2	104,449	1	7,926,183	2	21,649	3	7,947,832
Subsidence	2	16,754	3	120,336	5	137,090	2	14,675	2	29,521	4	44,196
Total	5	666,097	15	1,018,580	20	1,684,677	8	10,619,092	26	4,217,790	34	[1]14,836,883

[1] Data do not add to total shown because of independent rounding.

Publications released in 1973 and 1974 that relate to the mineral industry of Pennsylvania include five by the Bureau of Mines,[2] two by the U.S. Geological Survey,[3] six by the Pennsylvania Bureau of Topographic and Geologic Survey,[4] and eight miscellaneous papers.[5]

Environment.—*Air Quality.*—DER's Bureau of Air Quality and Noise Control is responsible for air and noise pollution control within the State. During the past 4 years, 711 air pollution abatement orders were issued that resulted in 409 cases of compliance. Many of the 409 orders were minor in nature, but litigation involving major polluters, such as the steel industry, were unresolved. The coke ovens in Western Pennsylvania are a major source of uncontrolled air pollution and a significant health problem to the Commonwealth.

The use of desulfurization devices and scrubbers to control sulfur dioxide emissions was the main issue in the Commonwealth's case against Pennsylvania Power and Light Co. (PP&L). DER recommended scrubbers, but the power company claimed they were not feasible. The commonwealth Court ruled in favor of PP&L, but DER appealed to the State Supreme Court.

In 1974, an automated 17-station network known as the Commonwealth of Pennsylvania Air Monitoring System became fully operational to measure ambient levels of air pollutants and meteorological variables.

The average sulfur dioxide level in Allegheny County was 15% less than that in 1973. Three-fourths of the County's 55 air monitoring stations measuring sulfur dioxide met the Federal ambient air quality standard of 0.03 parts per million, but three areas located near steel mills had average annual sulfur dioxide levels of 0.05 parts per million. The 15% reduction was attributed to stringent county regulations requiring industries and electric utilities to convert to low-sulfur fuels, phase out inefficient coal-fired power stations, and expand use of gas cleaning equipment. All but 2 of the County's 25 particulate monitoring stations recorded levels above the Federal standard (75 micrograms per cubic meter). The Clairton and Braddock areas had average monthly levels four to six times the County standard of 23 tons per square mile. Three ozone measuring monitors were installed in 1974. During the summer the Federal ozone standard (0.08 parts per million for 1 hour) was exceeded in one day out of three in Lawrenceville and at the Monroeville airport, and one day out of

[2] Bolstad, D. D., J. R. Alldredge, and M. A. Mahtab. Procedures Used for Sampling Fracture Orientations in an Underground Coal Mine. BuMines RI 7763, 1973, 9 pp.

McCulloch, C.M., and M. Deul. Geologic Factors Causing Roof Instability and Methane Emission Problems. The Lower Kittanning Coalbed, Cambria County, Pa. BuMines RI 7769, 1973, 25 pp.

Kim, A. G. Methane in the Pittsburgh Coalbed, Washington County, Pa. BuMines RI 7969, 1974, 16 pp.

Magnuson, M. O. Control of Fires in Abandoned Mines in the Eastern Bituminous Region of the United States. A Supplement to Bulletin 590. BuMines IC 8620, 1974, 53 pp.

Seibel, R. J., and F. E. McCall. The Dustiness of Different Coal Seams. BuMines TPR 75, 1974, 9 pp.

[3] Epstein, J. B. Map Showing Slate Quarries and Dumps in the Stroudsburg Quadrangle, Pennsylvania–New Jersey, With a Discussion of Their Environmental Significance. U.S. Geol. Survey Misc. Field Studies Map MF 578A, July 1974.

Wood, G. H. Jr. Geologic Map on Anthracite-Bearing Rocks in the Southern Half of the Delano Quadrangle, Schuylkill County, Pa. U.S. Geol. Survey Misc. Invest. Series I–737, September 1974.

[4] Kent, B. H. Isopach Maps of Overburden on the Pittsburgh Coalbed in Southwestern Pennsylvania and Northern West Virginia. Pa. Geol. Survey Open-File Rept. 74–132, September 1974, 6 pp.

Kent, B. H. Geologic Causes and Preventions of Roof Falls in Room-and-Pillar Coal Mines. Pa. Geol. Survey 4th Series IC 75, 1974, 17 pp.

Lapham, D., and C. Gray. Geology and Origin of the Triassic Magnetite Deposit and Diabase at Cornwall, Pennsylvania. Pa. Geol. Survey Bull. M56, 1974, 343 pp.

Lytle, W. S., and L. Heeren. Oil and Gas Pipelines in Pennsylvania. Pa. Geol. Survey Map updated to October 1974.

Lytle, W. S. Oil and Gas Developments in 1973. Pa. Geol. Survey. September 1974, 44 pp.

L'Neill, B. J., Jr. Greater Pittsburgh Construction Aggregates. Pa. Geol. Survey Miner. Res. Rept. 67, 1974, 60 pp.

[5] Bleakley, W. B. Penn Grade Crude Oil Yields to Steam Drive. Oil and Gas J., v. 72, No. 12, Mar. 25, 1974, pp. 89–90, 92, 94, 96.

Cloos, E. Mining Cambrian Limestone at Thomasville, Pennsylvania. Dept. of Earth and Planetary Sci., Johns Hopkins Univ., Baltimore, Md., 1974.

Glaeser, J. D. Alternative Sedimentary Associations of Uranium in Devonian Catskill Deposits in Pennsylvania. Dept. of Geology, Univ. of North Carolina, Chapel Hill, N.C., 1973.

Federal Power Commission. Water Resources of the Clarion River Basin in Pennsylvania. Rept. No. 20324, May 20, 1974.

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Lovell, H. L. Coal Mine Drainage Pollution. Earth Miner. Sci., v. 42, No. 7, April 1973, pp. 54–JJ.

Thakur, P. C. Mass Distribution of Respirable Dusts From U.S. Cools. Colliery Guardian, v. 222, No. 7, July 1974, pp. 2–3.

Weaver, O. D., Y. Hande, and J. D. Hea. Cambro-Ordovician Objectives: Appalachian Valley and Ridge Gas. Oil and Gas J., v. 72, No. 31, Aug. 5, 1974, pp. 96–99.

four in Penn Hills, all areas downwind of downtown Pittsburgh. Ozone is produced by the action of sunlight on hydrocarbons and nitrogen oxides. The County Health Department's long-standing complaint against United States Steel Corp. Clairton coke works was upheld in a unanimous decision by Commonwealth Court. The corporation's subsequent appeal to the Pennsylvania Supreme Court was rejected. The county air pollution variance board upheld the Health Department's compliance order to control fugitive emissions at United States Steel's Thomson works in North Braddock and the Duquesne works. The firm pledged a $5 million cleanup within 30 months. The County Health Department filed two civil complaints against United States Steel for exceeding particulate limits at its National works in McKeesport and its Homestead works in Homestead and Rankin. The firm promised a cleanup plan by yearend for particulate emissions from all of the coal-fired boiler plants in the Monongahela Valley and placed $87,000 in escrow to be forfeited if the plan was not acceptable. United States Steel also agreed to pay the county the $15,000 cost of testing smokestack emissions. The firm said it would either convert from coal to fuel oil at an estimated cost of $10 million or install electrostatic precipitators costing about $23 million.

Short-term variances for the 1973-74 winter heating season for firms that could not obtain low-sulfur fuels because of the fuel shortage were granted by the Allegheny County Commissioners to Duquesne Light Co.'s steam heating plant, Edgewater Steel Corp., Pittsburgh Brewing Co., and United States Steel's Irvin works.

Variances originally denied United States Steel for particulate emissions from sintering plants at the Homestead works and the Edgar Thomson works were granted on a short-term provisional basis after the firm submitted a plan calling for enlarged electrostatic precipitors and new baghouse collection systems.

Expenditures for both actual and planned emission reduction equipment to be completed in Philadelphia County in the 1974-75 period comprised $350,000 for two baghouse systems to collect 12.25 tons per year of particulates from ferrous electric arc furnaces, equipment costing $1,250,000 to collect 18 tons per year of particulates from one nonferrous electric induction furnace, a baghouse costing $200,000 to collect 4,250 tons per year of dusts at an asphalt batching plant, a baghouse costing $400,000 to collect 365 tons per year at a coke manufacturing plant, and equipment costing a total of $6,000,000 to recover 2,190 tons per year of hydrocarbons at two petroleum refineries.

In testimony before a regional Federal Energy Administration public hearing board in September, the Penn Central Transportation Co. charged that the Clean Air Act reduced the company's coal traffic from 96.6 million tons in 1968 to 79.0 million tons in 1973. A study made by the railroad showed that powerplants on its lines could save more than 100 million barrels of oil annually by using coal. The railroad company showed that the sulfur-limiting standards of the Environmental Protection Agency (EPA) would bar the use of most Pennsylvania coal completely after mid-1975.

In March, the Pennsylvania Commonwealth Court unanimously upheld a lower court opinion that emission control technology was not commercially available for the removal of sulfur oxides from stack gases.

Mined Land Reclamation.—A total of 13,831 acres were restored in Pennsylvania during 1974. Of this total, mine operators restored 12,800 acres, and the State, 1,031 acres. The DER's Div. of Mine Area Restoration reported plantings on lands at abandoned mines in 1974 using State funds under Pennsylvania Act 443, known as "The Land and Water Conservation and Reclamation Act." The plantings comprised 100 acres planted with grasses in the anthracite region costing $183,300 and 931 acres in the bituminous region of which 831 were planted with grasses and 100 acres with trees at a total cost of $3,471,000. According to a DER Forester, the majority of the anthracite acreage was planted with a grass-legume, and the remaining acreage, with 8,440 tree seedlings and 35,050 shrubs.

The leading county in the bituminous region was Clearfield with a total reclaimed acreage of 1,758.43 followed by Clarion, Armstrong, Somerset, and Jefferson.

In 1974, DER issued 1,138 strip mining permits, 31 for the anthracite area and 1,107 for the bituminous region. Table 7 shows the permits issued and acres affected and restored by active mines during the year.

Table 7.—Pennsylvania: Mining permits issued and total acreage affected and restored in 1974

	Number of permits issued	Coal production	Mine operators		State			
			Acres affected	Acres restored	Acres restored	Acres planted		Cost
						Grass	Trees	
Anthracite	31	2,812,618	350	300	100	100	--	$183,300
Bituminous	1,107	36,056,422	14,000	12,500	931	831	100	3,471,000
Total	1,138	38,869,040	14,350	12,800	1,031	931	100	3,654,300

Table 8 shows the number of acres planted with trees, grasses, and trees and grasses in the bituminous region. Current reclamation practices in Pennsylvania are thoroughly described.[6]

The Bituminous Subsidence and Land Conservation Act of 1966 requires coal supports underground to protect surface structures. During the past 4 years the Subsidence Regulations Div. permitted the mining of approximately 200 million tons of coal while providing surface protection for nearly 5,000 structures valued at more than $50 million.

The Coal and Clay Mine Subsidence Insurance Act of 1962 insures home owners against damage resulting from mine subsidence both for commercial as well as residential structures. During 1974 the insurance rates were reduced. The amount of insurance that can be purchased ranges from $5,000 to $50,000, at a cost of from $15 to $51 per year for anthracite dwellings with slightly lower rates for homes in the bituminous region. The deductible clause has been set at $250. At the present time the fund has approximately 7,200 insurance policies in force with a total volume of insurance of $170 million

[6] Jones, W. G. Reclamation Today in Pennsylvania. Coal Min. and Process., v. 11, No. 6, June 1974, pp. 33–35, 58, 60.

Table 8.—Pennsylvania: Surface mine reclamation at bituminous coal mines, trees and grasses planted, January 1–December 31, 1974

County	Trees		Grasses		Trees and grasses	
	Number of sites	Acres	Number of sites	Acres	Number of sites	Acres
Allegheny	--	--	5	251.30	--	--
Armstrong	2	32.10	35	699.63	1	13.90
Butler	--	--	13	255.02	--	--
Cambria	--	--	4	31.60	1	6.60
Centre	--	--	1	20.00	--	--
Clarion	11	368.80	19	556.06	3	42.30
Clearfield	24	503.57	35	645.74	26	609.12
Clinton	1	26.00	--	--	--	--
Elk	--	--	4	140.20	1	22.70
Fayette	--	--	15	78.85	--	--
Greene	--	--	6	256.66	--	--
Huntingdon	1	1.00	--	--	--	--
Indiana	2	17.50	12	315.69	--	--
Jefferson	3	20.00	23	363.70	9	132.40
Lawrence	--	--	3	106.60	--	--
Lycoming	--	--	2	18.20	--	--
Mercer	--	--	4	146.20	--	--
Somerset	5	84.71	23	436.13	1	30.00
Tioga	--	--	4	111.27	--	--
Venango	--	--	9	196.30	--	--
Washington	1	2.94	4	115.50	1	15.50
Westmoreland	--	--	16	192.18	--	--
Total	50	1,056.62	237	4,935.83	43	872.52

The Div. of Licensing and Bonding of the Bureau of Surface Mine Reclamation issued mining permits to those operators meeting State filing requirements. During 1974, 37 applications were received and 31 issued to anthracite operators while 1,431 applications were filed in the bituminous region and 1,107 permits issued. The amount of bond required to insure effective reclamation of all mined land totaled over $300,000 in the anthracite region and over $13 million in the bituminous area. Bonds are released if reclamation is completed, and during 1974 only three bonds totaling $15,000 were forfeited by mine operators.

Pursuant to the Appalachian Regional Development Act of 1965, as amended, the status of projects approved by the Appalachian Regional Commission (ARC) in fiscal year 1974 is shown in table 9.

Table 9.—Pennsylvania: Status of ARC projects in fiscal year 1974

Project	Status	County	Cost
Mine fire control	Completed	Allegheny	$50,502.46
Do	Started	Washington	63,222.90
Do	do	Allegheny	63,405.60
Do	Completed	Indiana	77,210.38
Do	do	Luzerne	732,818.60
Subsidence control	Started	Lackawanna	1,603,783.50
Do	In progress	do	2,592,121.29
Do	Started	do	6,590,977.00
Do	Completed	Luzerne	475,611.30
Mine refuse bank reclamation	do	Lackawanna	62,532.05
Well sealing	Started	Clarion	54,570.00

Solid Waste Management.—Act 241, Pennsylvania Solid Waste Management Act, provides for the planning and regulation of solid waste storage, collection, transportation, processing, and disposal. In November, the State's Community Affairs Office issued a $28,303 grant for an experimental program to remove an estimated 1,000 junked automobiles from urban, suburban, and rural areas of Erie County and recycle them into useful products.

Water.—To fulfill requirements of the Clean Streams Act and the 1972 amendments to the Federal Water Pollution Control Act, the Bureau of Water Quality Management is undertaking a Comprehensive Water Quality Management Plan. This study divides the State into nine areas to provide the people an opportunity to relate land and water uses to water quality management in a comprehensive planning effort.

Accomplishments of water planning show a net gain of more than 185 miles of the State's stream improvements of more than 600 miles. About 75 miles of the Monongahela River improved as a result of mine drainage treatment and abatement activities. This improvement was significant enough to make possible stocking of muskellunge and taking of bass by fishermen.

Section 16 of Act 443 "The Land and Water Conservation and Reclamation Act" empowers and authorizes construction and operation of water treatment plants for the control and treatment of water pollution resulting from mine drainage. The act permits mine operators to discharge mine drainage to water treatment plants at a charge based upon their proportional share of the capital and operating costs and the quantity and quality of the pollutant as shown in table 10. Presently, mine operators are being charged at a rate of 15 cents per salable ton. (Salable tons equal total tons produced times percent of recovery.)

Table 10.—Pennsylvania: Aggregate total of payments received from mine operators since the inception of water pollution control programs

County	Number of operators	Tonnage	Amount
Dauphin	5	139,927	$20,853.40
Northumberland	34	260,364	38,775.26
Schuylkill	91	2,446,792	366,747.37
Total	130	2,847,083	426,376.03

Mine sealing and other abatement measures resulted in a cleanup of 12 miles of Raccoon Creek and 19 miles of Crooked Creek in Indiana County.

The responsibility of mining companies underwent extensive litigation during the year. In mid-February, the U.S. Supreme Court refused to grant oral arguments in the case of the Commonwealth versus Harmar Coal Co. on the ground that it presented no substantial Federal question. Harmar Coal was pumping contaminated water that did not originate in the company's mines. The Commonwealth Court ruled in favor of Harmar, but the Pennsylvania Supreme Court reversed the decision and held the mining company responsible for treating all acid mine drainage discharged as a result of active mining operations. The U.S. Supreme Court refused to hear this case.

In another case the Commonwealth Court decided in favor of the Barnes and Tucker Coal Co., but was reversed by the State Supreme Court. This case involved acid mine drainage over a 4-year period from a mine in Cambria County. The exact amount of Barnes and Tucker's liability wasn't determined at the end of the year and one unresolved issue was the payment of the State's estimated $4 million spent to protect the Susquehanna River over the 4-year period.

In mid February, DER and the Leechburgh Mining Co. agreed to a plan whereby the company would reclaim a 200-acre refuse disposal area near the Kiski River. DER agreed to expedite a permit for mine drainage, a disposal permit for a new coal refuse dump, and a water quality management permit for related treatment facilities.

A mine drainage treatment lagoon, costing $204,000 started operations in December near the old Wildwood mine near North Park. Stainless steel aerating trays will be used to oxidize ferrous iron in the mine drainage by contact with air.

By midsummer, a new DER treatment plant was producing 800,000 gallons per day of potable water at a reasonable cost from one of the abandoned mines in the Philipsburg area. The Hawk Run plant used Amberlite ion-exchange resins in a modified Desal process developed by Rohm and Haas Co.

The Rausch Creek treatment plant located in Schuylkill County was commissioned in 1974. The facility in the anthracite region cost $2.5 million and has a capacity to treat 10 million gallons per day of acid mine drainage.

The Altoona water treatment plant was built to treat all of Kittanning Run to stream quality and to blend four sources to potable quality for use by the City of Altoona. This plant will be turned over to the city in early 1975. Table 11 is a list of treatment plants in Pennsylvania funded under Act 443.

Table 11.—Pennsylvania: Water treatment plants

County	Plants		Contract amount	Status
	Number	Name		
Blair	1	Altoona	$5,022,403.03	Construction.
Butler	1	Slippery Rock	809,834.45	Operating.
Carbon	1	Buck Mountain	40,025.00	Do.
Clearfield	1	Hawk Run	2,717,588.55	Construction.
Elk	1	Swamp Creek	76,729.50	Operating.
Indiana	1	Crooked Creek	119,000.00	Design.
Luzerne	1	Sandy Run	48,995.00	Completed.
Schuylkill	1	Rausch Creek	2,488,663.57	Construction.
Washington	1	Smith Township	823,289.00	Operating.
Do	1	Pigeon Creek	53,187.48	Do.
Total	10		12,199,715.58	

The status of DER watershed studies for 1974 according to the Div. of Mine Area Restoration is shown in table 12. DER and the Wheeling-Pittsburgh Steel Corp. reached a consent agreement covering installation of water pollution control equipment at the firm's Monessen works. The partially closed system to be completed by December 31, 1975, will prevent the discharge of waste from coke oven and blast furnace operations. Under the agreement the firm will pay $500 per month into the Clean Water Fund until the facilities are operating satisfactorily. In late October the DER identified the source of naphthalene in the Western Pennsylvania Water Co.'s system to the byproduct section of the Jones & Laughlin (J&L) coke plant on the Monongahela River. DER revoked the industrial waste permit of the Mill Services near Yukon, a processor of steel plant spent pickling liquor following a Clean Stream Law violation on November 14.

Table 12.—Pennsylvania: Status of DER watershed studies for 1974

Description	Initiated		In progress		Completed	
	Number	Cost	Number	Cost	Number	Cost
Acid mine drainage studies in the anthracite coalfield.	1	$79,000	5	$692,000	2	$106,500
Acid mine drainage studies in the bituminous coalfield.	2	190,000	28	3,070,000	4	162,500

The Federal Coastal Zone Management Act of 1972 will provide Pennsylvania, one of the 30 coastal States, including the States of the Great Lakes, with resources necessary to develop the 48-mile Lake Erie shoreline and the 45-mile section of the Delaware River influenced by tides. DER's Coastal Zone Management Program is concerned with the uses of all the States' coastal waters and with the uses of the land in a comparatively narrow strip along these waters.

The three-member Environmental Hearing Board considered an appeal from a DER decision to restrict dredging operations for sand and gravel in the Upper Allegheny River. The Board found that minimal long-range economic disruption would result from restricting dredging and that the recreational values thus preserved would far outweigh it. However, the Board granted the companies an extension for approximately 1 year for dredging into natural and untouched areas, based on its conclusion that the "substantial risk of severe temporary economic impact of continuing to limit dredging to previously dredged areas justified an extension." Both sides appealed this decision to Commonwealth Court.

REVIEW BY MINERAL COMMODITIES

MINERAL FUELS

Coal (Anthracite).—Production at the Glen Nan Coal Co.'s 16-year-old Forge Slope, the last large-scale deep mine in Luzerne County, terminated February 21 with the loss of 200 jobs. Dewatering pumps were kept in operation until late April. Reportedly, the mine was shut down because of Federal mine safety issues. A company spokesman said that reserves of high-quality coal in the mine were sufficient to assure a 500,000-ton-per-year production for 100 years.

Closure of the Blue Coal Corp. Wanamie stripping and Huber breaker operations in late May resulted in lost production of 580,000 tons per year and 340 jobs. Purchasers of Blue Coal Corp. holdings announced in midyear that the Huber breaker and nearby underground and surface mines were being leased to independent operators. Production was not expected to resume in time or be of sufficient quantity to provide the approaching winter needs. Independent truckers started bringing in anthracite for home heating from the Hazleton area and southern producing regions. Blue Coal's closing prompted a rush toward residential gas heating in Luzerne and Lackawanna Counties. However, the Pennsylvania Gas and Water Co. discontinued approval of new residential customers because its 1974 quota had been filled.

In October, Beltrami Enterprises, operator of the leased Huber breaker in Ashley, increased the prices of small sizes by $3.00 per ton to $48.00 per ton, and the prices of stove and chestnut sizes by $3.00 per ton to $53.75 per ton. Delivery charges, varying according to trucking distances, were added to these prices.

Anthracite valued at about $5 million was delivered to 29 State institutions. The anthracite was of better quality than that delivered in prior years according to samples submitted to independent testing laboratories. However, domestic consumer complaints on quality and billing weights increased. In many cases the coal companies replaced the coal or refunded the purchasers' money.

In late May, anthracite producers in the Wilkes-Barre region started retroactive wage payments to miners for an increase due under an April 16, 1972, agreement. The backpay, averaging $300 to $350 per miner, was to be paid in six installments.

In mid-December, Bethlehem Steel Corp. acquired 8,000 acres of reserves in Schuylkill and Carbon Counties, three operating strip mines, and two coal processing plants from the Greenwood Stripping Corp. Greenwood in 1973 employed 300 workers producing 420,000 tons. Bethlehem promised to honor Greenwood's unexpired contracts, about 70% of which were with industrial users and the rest for domestic heating.

Counsel for the Pensioned Anthracite Miners Committee, representing 15,000 pensioners, filed suit in the U.S. District Court in July asking $9 million in uncollected production royalty payments and $9 million in interest. The suit claimed mismanagement of the pension fund by officials of the United Mine Workers of America (UMWA) in the 1950's.

In June, Blue Coal Corp. and related coal companies agreed to pay in full all royalties due the Anthracite Health and Welfare Fund. The payment dismissed eight suits filed in the preceeding 3 years.

On August 16, the Swoyersville Borough Council adopted ordinances controlling the storage of coal refuse in the Borough, defining various terms and usage, detailing violations, and establishing penalties. On September 17, the Sullivan Trail Coal Co., West Pittston, requested an injunction against enforcement of the ordinances.

Helker Construction Co., Mt. Carmel, continued work to extinguish fires in mine refuse banks and to recontour 3 million cubic yards of refuse at the onetime Williamstown Colliery. The entire area was to be seeded with grass to provide a recreational area.

In September, legal problems delayed the allocation of Federal funds to extinguish burning areas of the Glen Burn culm bank and three underlying coal seams in Northumberland County.

On August 19, the Secretary of the Interior established the Anthracite Production Assistance Office to aid producers in increasing their production. The Office initiated a producer canvass on the availability of mining equipment for purchase or lease. The Office also forwarded complaints from homeowners and businesses to the proper State agency and visited

active and temporarily inactive operations to determine the problems exising in all parts of the industry.

Representatives of the Department of the Interior, Federal Energy Administration (FEA), and Small Business Administration (SBA) met in Scranton November 2. They agreed to (1) contact the Wage and Price Stabilization Office to investigate price gouging; (2) initiate a waste bank sampling program to determine economic values; (3) survey possible sources of financial assistance to bring into production key coal processing facilities; (4) evaluate the authority and usefulness of commencing demonstration projects with improved coal processing; (5) ask the Department of Defense to review its short-term delivery schedules to see if further reductions in deliveries could be made in the 4-month period ending February 28, 1975; and (6) have the Bureau of Mines assess the practicability of adopting advanced augering or boring systems for steeply pitching seams in underground mines.

The president of the Independent Miners and Associates recommended that the Federal Government (1) guarantee an adequate future market, (2) underwrite a miners' training program, (3) lower the water level in mines, (4) take remedial action to change mine safety laws, (5) subsidize production for stockpiling purposes, and (6) make any allocations.

In October, the University of Scranton received a research grant from the Office of Coal Research (OCR) to conduct an advanced anthracite technology research conference in January 1975. The primary objective of the grant was to determine priority areas for research and development most likely to demonstrate the feasibility of increased anthracite use.

The first of a series of reports evaluating the energy situation in northeastern Pennsylvania was released in November 1973 by the Economic Development Council of Northeastern Pennsylvania, Avoca. The 24-page report is titled "The Residential Uses of Energy in Northeastern Pennsylvania."

The Secretary of the Interior on August 30 ordered new efforts, including expanded research and development by the Bureau of Mines, aimed at reversing the decline of the Pennsylvania anthracite industry, the Nation's only source of clean-burning, high-energy hard coal.

Production of anthracite has been declining since 1917 when over 100 million tons were produced with approximately 156,000 employees as compared to 6.61 million tons and 3,800 employees in 1974. Bank production totaled 2.9 million tons; stripping production, 2.9 million; and deep mine production, 657,000 tons; anthracite production in 1974 was the lowest since 1870, when statistics were first recorded by the State.

During 1974, anthracite was produced in 11 northeastern counties. Schuylkill produced over 3 million tons followed by Luzerne with 1.5 million; Northumberland, 1.2 million; Carbon, 0.2 million; Lackawanna, 0.17 million; Dauphin, 0.09 million; followed by Berks and Snyder, Columbia, Sullivan, and Susquehanna Counties.

Total employment in the anthracite region in 1974 was 3,831. Strip operations accounted for 1,376 employees; breaker and washery, 1,366; deep mines, 699; and banks, 390.

According to State sources, during 1974 there were 174 anthracite operators, which included 38 companies operating strip mines. Twenty-seven mining companies produced over 5 million tons or more than 80% of the total production from the anthracite region while the top 10 companies produced 3.69 million or more than 60% of the total. See table 13.

Table 13.—Pennsylvania: Leading anthracite producing companies in 1974

Company	Short tons
Reading Anthracite Co	775,521
Jeddo-Highland Co	699,735
Hecla Machinery and Equipment Co	350,955
Greenwood Stripping Corp	346,322
Leon E. Kocher Coal Co	336,817
Gilbertson Coal Co	275,896
Manbeck Dredging Co. Inc	258,420
Beltrami Enterprises, Inc	240,457
B & D Mining Co	210,698
Lehigh Valley Anthracite Inc	201,695
Total	3,696,516

Source: Commonwealth of Pennsylvania, Dept. of Environmental Resources. Annual Report on Mining, Oil and Gas, and Land Reclamation and Conservation Activities, 1974.

Table 14.—Pennsylvania: Summary of anthracite operations in 1974

District	Operators	Number of mines			
		Deep mines	Bank mines	Strip mines	Breaker and washery plants
1	7	--	--	13	--
2	8	--	--	15	--
3	12	--	--	31	--
4	15	--	--	25	--
5	24	3	21	--	20
6	19	5	20	--	11
7	27	[1]16	6	--	11
8	12	7	5	--	4
9	22	4	22	--	20
10	29	18	5	--	9
11	14	9	3	--	4
12	24	17	3	--	5
Total	[2]213	79	85	84	84

[1] One deep mine is a tourist attraction.
[2] Some companies operate in more than one district. The total number of anthracite operators is 174, which includes 38 companies operating strip mines.

Source: Commonwealth of Pennsylvania, Dept. of Environmental Resources. Annual Report on Mining, Oil and Gas, and Land Reclamation and Conservation Activities, 1974.

Over 4.2 million tons of coal was shipped to market by truck, 2.4 million was shipped by rail, and 12,000 tons was used for colliery fuel.

Two fatal accidents occurred in the anthracite region during the year; one was an underground fatality caused by a blast, and the other, a stripping fatality. The number of nonfatal accidents totaled 262.

Coal (Bituminous).—Bituminous production for the year was in excess of 80 million tons, an increase of over 4 million tons from that of 1973.

This was due to an increase in strip production in excess of 6 million tons with slight increases also in augering and refuse production. A decline of approximately 4 million tons occurred from deep mine production caused by contract negotiations, unauthorized work stoppages, and wildcat strikes throughout the bituminous coalfields.

In early January a strike over job bidding involving a continuous miner idled 500 miners at the Jane and Emily mines operated by the Rochester and Pittsburgh Coal Co. In early February both of these mines were again idle. Company officials said they had no idea why the miners stopped work, but a union spokesman said it involved "idle time work" when machinery was being repaired. Later in the year another work stoppage was caused by a safety issue over transportation procedures of injured miners.

At the Blacklick and Robinson portals of the Florence Mining Co. near Seward, the two mines were idled for a period of time over seniority protection and the problem of two separate union locals when the two mines are connected underground. A Federal judge in Pittsburgh ordered the 750 miners to return to work immediately.

A 1-day strike over unsafe equipment occurred at U.S. Steel's Maple Creek mine near Monongahela in Washington County. A U.S. District Court judge ordered the miners back to work. Another order was also issued returning about 830 coal miners to work ending a 6-day strike at the Greenwich Collieries located in Cambria County.

Approximately 10,000 miners were idled in western Pennsylvania and parts of West Virginia in late April resulting in a daily production loss of approximately 200,000 tons of coal. The strike began at the Florence No. 2 mine in Indiana County over picketing activities that resulted in the dismissal of two miners. Court orders to return to work were ignored by the miners.

Near Ebensburg, about 600 coal miners employed at Bethlehem Mines Nos. 32 and 33 mine as well as the preparation plant walked off the job over bathing facilities for three women co-workers. The miners protested the loss of part of their locker room area for a separate shower for the women employees. The three women had been showering in a trailer provided by the company.

Early in the year the U.S. Supreme Court in an 8-to-1 decision denied the right of coal miners to strike over poten-

tially unsafe conditions in the mines and ruled they must submit to arbitration in such disputes, as required by the contract between the United Mine Workers of America (UMWA) and coal operators. The court reversed an appeals court ruling that miners at a Gateway coal mine could strike over the return to work of three foremen who had been suspended after State inspectors charged them with a safety violation. The Court suggested that the Congress did not intend that the "public policy favoring arbitration and peaceful resolution of labor disputes be circumvented by so slender a thread as subjective judgement."

With the November 12th expiration date of the coal contract, an estimated 22,500 union miners within the State were idle. Some nonunion strip mines remained open, but many shut down to avoid confrontations with union members. The railroads, barge crews, and truckers were among the first to feel the impact of the strike. Negotiations between the union and Bituminous Coal Operators' Association continued, and on December 5 a 3-year contract was signed; however, the mines did not return to full production until a contract was signed on December 10 with the 4,000-member mine construction workers who build mining shafts, tipples, and bathhouses.

Even though underground mine production declined during the year, mine operators remained optimistic and continued to plan new mine openings to meet the energy needs.

United States Steel will open a mine on its Cumberland coal reserve lands in Greene County to supply Ontario Hydro of Canada with 3 million tons per year for a 30-year period. Initial production is planned in 1976 with coal being shipped over a new 17-mile railroad from the mine to the Monongahela River, then by barge and finally by rail to the Lake Erie port for loading aboard ship. Employment at the mining operation will be approximately 850. The average sulfur content of the coal will be about 1.8%. Dravo Corp. has been awarded a turnkey contract to engineer and construct the coal preparation and unit-train loading systems. Dravo's work will begin at the coal seam and terminate at the rail loading point.

North American Coal Corp. plans to open its Josephine No. 2 mine with an annual capacity of 250,000 tons.

Solar Fuel Co. will open the No. 7 mine producing 240,000 tons per year and plans to open the No. 9 mine with a 144,000-ton capacity.

Lykes-Youngstown Corp. has announced that a newly formed subsidiary, Emerald Mines Corp., will develop and operate two new metallurgical coal mines within the State. The Emerald mine will reach full production of 2 million tons per year within a 3-year period. Roberts and Schafer Co. has recently been selected as the prime contractor for construction of the $18 million preparation plant.

Consolidation Coal Co. plans to open the 750,000-ton-per-year Laurel mine located near Central City in late 1974. A two-compartment slope will be used for coal haulage and for transportation of men and supplies while the 360-foot, 20-foot-diameter, two-compartment shaft will be used for both intake and return airways. The 7.5-foot-thick Lower Kittanning "B" seam will be mined.

In December, Alco Standard Corp. announced new lease agreements with three Penn Central Transportation Co. subsidiaries covering 54,000 acres of coal land in central Pennsylvania to be mined by its Barnes and Tucker subsidiary. Barnes & Tucker will make fixed lease payments of $9 million to Manor Real Estate Co., Clearfield Bituminous Coal Corp., and Western Warehousing Co. for mining rights to an estimated 184 million tons of recoverable coal reserves. Additional payments will also be made based on production from the properties.

Alco Standard also agreed to sell the Barnes and Tucker Lancashire mine located near Barnesboro, Cambria County, to an Inland Steel subsidiary.

Cerro Corp. has also become interested in coal production and has acquired an option to buy Fetterolf Coal Co. and related companies for $32 million in cash.

Gulf Resources and Chemical Corp. of Houston, Tex., has purchased coal lands and equipment in Cambria and Clearfield Counties. The properties were acquired by two subsidiaries, GRC Coal Co. and Cambria Coal Co., for $4.2 million, of which $3 million is represented by an installment note of the acquiring companies secured by the properties. Production will be increased from 150,000 tons to 600,000 tons per year by investing approximately $4.6 million for additional mining equipment and related facilities.

Consolidated Natural Gas Co.'s subsidiary, Consolidated Gas Supply Corp., has agreed to buy more than 150 million tons of recoverable coal reserves in southwest Pennsylvania from Manor Real Estate Co., a subsidiary of Penn Central Transportation Co. The reserves will be used for coal gasification purposes. Manor Real Estate Co. has also agreed to sell bituminous coal reserves to PP&L.

Pullman Inc. said it has sold its 80% interest in Aloe Coal Co., a surface mining operation in the western part of the State, to a minority stockholder of Aloe.

Bethlehem Mines Corp. recently began planning for mine 78, a drift mine located near Windber with full production by late 1975. Bethlehem has also acquired the Fawn mine located near Saxonburg from Union Carbide Corp. The Ellsworth Div. of Bethlehem Mines Corp. will operate the mine, which has an estimated life of 12 to 15 years and will be known as mine No. 91.

Table 15.—Pennsylvania: Major new coal mine developments in 1974

Company	Mine		Opening date	Full capacity (short tons)
	Name	Type		
Bethlehem Mines Corp	Cambria No. 78	Deep	1974	484,000
	Cambria No. 91	do	1974	450,000
Consolidation Coal Co	Laurel	do	1974	750,000
S & D Trucking Co	Cookhouse	Strip	1974	100,000
U.S. Steel Corp	Dilworth	Deep	1975	3,000,000
Helvita Coal Co	Lucerne No. 8	do	1975	300,000
Do	Lucerne No. 9	do	1976	85,000
Emerald Mines Corp	Emerald	do	1977	2,000,000
North American Coal Corp	Josephine No. 2	do	NA	250,000
Solar Fuel Co	No. 7	do	NA	240,000
Do	No. 9	do	NA	144,000
Total				7,803,000

NA Not available.

Shipments of new equipment to the State's underground coal mines in 1974 included 43 continuous miners, one longwall unit, 47 shuttle cars, 18 rubber-tired tractors, 65 battery-powered front-end loaders, and 26 gathering and haulage conveyor units. There were no loaders or cutting machine shipments to the underground mines during the year. The increase in continuous miners from 33 in 1973 to 43 in 1974 and the decline in mobile loaders and cutting machines reflects recent continuous miner design improvements that give greater coal-cutting strength and higher capacity.

Joy Manufacturing Co., a major producer of mining machinery, will increase the size of its Franklin plant to meet future equipment needs. The president of the company said completion of the project is expected during the first half of 1975.

Babcock and Wilcox Ltd., London, has acquired the Irwin Sensenich Div. of the Whittaker Corp., a manufacturer of longwall mining systems, mine cars, and other mining equipment. The Irwin, Pa., based division is changing its name to Huwood-Irwin Co. Ltd.

Surface mine operators may be faced with parts and replacement shortages. The president of the Western Pennsylvania Surface Coal Miners Association called for a 3- to 6-month moratorium on the State's backfilling requirements because bulldozer undercarriage parts are in short supply due to heavy orders of new bulldozers to foreign countries as well as to Alaska. State reclamation officials stated there would be no such moratorium.

Jefferson County residents are concerned with possible stripping operations on the watershed of the north fork of the Redbank Creek, one of the few remaining unpolluted streams in the area. Two miles of the stream is a "Fish for Fun" project, and another 2 miles is a fish nursery. The coal in question is from the highly acid lower Kittanning seam and tests prove a threat of acid pollution.

Environmental organizations are also concerned with possible stripping operations on the border of McConnells Mill State Park. They say that the Hells Run

and Skunk Run tributaries of the Slippery Rock Creek would become polluted and destroy the esthetic quality of that section of the park.

Although coal mines located in Washington County had a net decline of 274,000 tons from the 1973 totals, it ranked number one in production within the State and 3,901,000 tons ahead of second-place Indiana County, which produced in excess of 9 million tons. Other counties with production in excess of 5 million tons per year included Greene 8.3, Clearfield 7.9, Cambria 5.5, Armstrong 6.7, Somerset 7.7, and Clarion with 5.2 million tons.

Deep mine production totaled in excess of 42 million tons with 36 million tons from strip mines, 1.2 million from refuse production, and less than one-half million from augering for a total bituminous production in excess of 80 million tons. This coal was produced at 148 deep mines, 1,029 strip mines, 51 auger mines and 13 refuse operations. Employees at deep mines totaled in excess of 19,000, more than 6,000 at strip operations, 123 at auger mines, and 151 employed at refuse operations for a total of 29,108 bituminous employees.

Coal loaded by hand has been decreasing, and during the year 87 employees were reported in this type of mining in the bituminous regions. Eleven were shot firers, 11 were pick miners, 10 were cutting machine operators, and 55 were classified as machine hand loading miners. Mechanical loading accounted for 11,640 employees while 5,399 were classified as other inside employees for a total of 17,126.

A breakdown of outside employees showed 2,386 listed as superintendents, foremen, and clerks; 49 as coke employees; and 9,547 as all others for a total of 11,982.

Total bituminous coal employees during the year was 29,108 as compared with 26,722 in 1973, an increase of 2,386.

The number of nonfatal accidents in the bituminous region decreased from 1,349 in 1973 to 1,185 in 1974, but fatal accidents increased by 3 for a total of 20.

Outside fatalities totaled eight; four were the result of stripping operations, two by outside loading, and one each by electricity and transportation.

Underground fatalities totaled 12 with falls of roofs resulting in 5 fatalities, machinery caused 4, and transportation was the primary reason for 3.

Fatalities occurred in every month of the year except July and November. Vacation periods for miners usually begin in late June and end in late July which reduces miner exposure for the 1-month period.

Although the number of deep mines in 1973–74 decreased by a total of two, employment increased by 801 due mainly to additional employees required for compliance with the Federal and State underground mining regulations.

During the year 30.4 million tons of coal were shipped to market by rail, 30.4 by truck, and 18.2 million by water. Less than one-half million tons were used locally for domestic purposes.

Many steel producers feared that a lengthy coal strike late in the year would reduce metallurgical coal stockpiles and force plant shutdowns. Roof bolts used in the support of mine roof were also reported to be in short supply. Governor Milton J. Shapp in early January said that several mines might close owing to the roof bolt scarcity. Producers said that the steel used was in short supply causing shortages at the underground mines. To meet the energy shortage Governor Shapp sponsored a conference and one committee reported the possibility of increasing coal production to 100 million tons within a 5-year period.

The number of tipples and cleaning plants totaled 185 during the year with additional plants proposed. North American Coal is currently operating the Oneida cleaning plant at Conemaugh No. 4 mine after 3 years of construction.

Duquesne Light Co. is operating a new coal preparation plant at its Warwick mine located in Greene County with a capacity of 1,000 tons per hour designed to recycle all water used in the washing process.

The thickest coal seam being mined underground is the 108-inch-thick Freeport in Armstrong County and the 108-inch Pittsburgh seam in Fayette County. The thinnest seam is the 30-inch lower Freeport being mined in Jefferson County and the 29-inch lower Kittanning seam in Clearfield County.

In early 1974 the State Insurance Department set black lung rates that will cost coal mine operators $9.48 for every $100 in employee salaries. These rates were set

in compliance with the State law that requires coal companies or their insurers to pay 100% of the costs of working coal miners.

A total communications and monitoring system developed by the Pittsburgh Mining and Safety Research Center is being installed at United States Steel's Robena mine. The installation will have 40 underground and 20 surface pushbutton dial phones, 30 carbon monoxide monitors along haulageways, 4 section monitors for carbon monoxide, air, and methane, 24 call alert pagers, and controls for the ventilation and mine pumps. The entire system operates from a single community antenna coaxial cable, with microwave loopback in case of accident to the cable.

Also being tested at the Robena mine is an emergency beacon that could be used to locate trapped miners underground. The locating beacon, powered by the cap lamp battery, is slightly larger than a cigarette pack and sends out low-frequency radio impulses that can penetrate up to 600 feet of strata. Receivers located on the surface pick up the signals. Rescue teams will determine if the trapped miner can be rescued underground or whether it will be necessary to drill a shaft from the surface.

At another United States Steel mine, the "Sentinels of Safety" award was presented to the Maple Creek No. 2 mine for working 674,468 man-hours during 1973 without a disabling injury. The award is the Nation's highest for mine safety presented jointly by MESA and the American Mining Congress.

Other research endeavors to protect the underground worker include standardization of mining machine controls and emergency breathing devices that could replace the self-rescuer. The new emergency breathing devices generate oxygen from chemicals contained in canisters as compared with the self-rescuers, which protect miners from carbon monoxide, but provide no oxygen and offer no protection against other toxic gases.

At three Pennsylvania mines, the exhaust from the surface fans is being monitored continuously to accurately determine methane liberation. The three mines are the Homer City mine, Helen Mining Co., North American Coal; the Lucerne No. 6, Helvetia Coal Co., Rochester and Pittsburgh Coal Co.; and the Marion mine, Tunnelton Mining Co. Results of tests are reported in Bureau of Mines Report of Investigations 7951.

Dr. Robert Stefanko of the Pennsylvania State University (PSU) suggests that methane should not be released to the outside atmosphere, but that it should be recovered in advance of mining to help ease the Nation's energy shortages in addition to improving underground mining efficiency by relieving a safety hazard. Dr. Stefanko also urged State officials to develop a methane data bank for all Pennsylvania coal seams as the first step toward utilization of the vast amounts of the gas occurring in underground mines. State officials said that several mining companies are interested in extracting methane from southwestern Pennsylvania coal mines. Tests at 40 of Pennsylvania's coal mines showed nearly 16 billion cubic feet per year of methane being exhausted to the outside atmosphere. State and corporate attorneys are working on several potential problems involving ownership of the methane. The State Attorney General recently provided an opinion that the methane gas released in bituminous as well as anthracite mines belongs to the holders of the gas rights rather than the coal operators. At the end of 1974 this issue had not been resolved.

Since 1964 the Bureau of Mines has conducted an active degasification program to improve coal mine health and safety by eliminating fatalities due to gas ignition and explosions; however, with the shortage of natural gas it became economical to use the product being exhausted to the outside atmosphere. Recently J&L's Vesta-Shanopin mine in southwestern Pennsylvania and the Federal Bureau of Mines are considering a project involving the drilling of 300 holes for degasification purposes. At first 60 holes will be drilled and hydrofractured for maximum methane release.

Coal Gasification.—Westinghouse Electric Corp., under contract from the Department of the Interior's Office of Coal Research, is building a demonstration plant to prove the feasibility of converting high-sulfur coal to a clean, low-Btu nonpolluting gas for electric power generation. The plant, at Waltz Mill, is nearing completion, and by 1978 a commercial size gasification plant will be built at the Dresser station of Public Service Indiana near

Terre Haute, Ind. The commercial plant when completed will use 55 to 60 tons of coal per hour to supply gas to a Westinghouse turbine, to be part of a combined cycle generating plant.

In April of 1974, Bituminous Coal Research Inc. (BCR), a subsidiary of the National Coal Association, was awarded a $2,575,000 contract to cover laboratory scale process and equipment development for the design of a low-Btu coal-gasification pilot plant. This low-Btu gas will have a heat content of 150 to 200 Btu per cubic foot and will be used for power generation purposes. BCR has recently developed a high-Btu process called BI-GAS, which is being tested in a pilot plant nearing completion at Homer City.

A $2,438,000 contract was awarded to the Lummus Co. of Bloomfield, N.J., the original designer of the plant nearing completion at Bruceton, Pa., to prove the feasibility of using coal to produce a high-quality pipeline gas.

At Johnstown, a pilot plant capable of turning 500 tons of coal into gas each day is being planned. This plant will be put into operation after further research is completed on a small plant being constructed near Pittsburgh. In Harrisburg, the State Senate is considering a bill authorizing the State to build coal conversion plants and leasing them to industry.

Continental Oil Co. is also taking an active part in coal conversion processes. A new subsidiary, Conoco Coal Developing Co., was formed utilizing research facilities at Library. Coal development activities include gasification of coal, production of high-Btu gas from raw synthesis gas, production of methanol from coal, development and commercialization of coal liquefaction, a new coke making process designed to minimize gas and dust emissions and permit processing of lower grades of coal, and a full-scale demonstration of a Consol process to remove SO_2 from powerplant stack gases.

Interest has been shown by oil companies in the Bureau of Mines Synthoil process, which can produce 0.2% sulfur fuel oil from coal containing as much as 5.5% sulfur. This process can convert 1 ton of coal to 3 barrels of liquid fuel per day. The one-half-ton-per-day unit at Bruceton is now being designed as an 8-ton-per-day pilot unit.

Gulf Oil Corp. is also planning a pilot coal liquefaction plant scheduled for completion by the end of 1974 located in Harmarville. This plant uses Gulf's Catalytic Coal Liquefaction process (CCL). This process builds on the Solvent Refined Coal (SRC) process developed by Gulf's subsidiary, Pittsburg & Midway Mining Co. In CCL a coal slurry is forged upward through an arrangement of fixed catalysts upon a stream of hydrogen at about 2,000 pounds per square inch pressure. This process is similar to the Synthoil process, except for differences in the arrangement of the catalysts.

For a 2-year period, Bethlehem Steel, under a cost-sharing cooperative arrangement with the Bureau of Mines, will operate a plant to test Synthoil technology at the Bruceton facility to develop a framework for early industrial use of the process.

Coke.—Pennsylvania ranked first in oven coke production with 27% of the U.S. production. Total coal received by the 12 plants was 23,981,000 tons and comprised 2,511,000 tons from Kentucky mines, 4,000 tons from Maryland mines, 13,565,000 tons from Pennsylvania mines, 5,000 tons from Tennessee mines, 1,068,000 tons from Virginia mines, 6,282,000 tons from West Virginia mines and 547,000 tons from West Germany. Oven coke plants received a total of 16,511,000 tons of high-volatile coal, 2,500,000 tons of medium-volatile coal, and 4,970,000 tons of low-volatile coal. The average value per short ton of coal carbonized at oven coke plants in 1974 was $36.44 as compared to $17.95 in 1973. The 12 plants carbonized 23,304,000 tons of bituminous coal and 493,000 tons of anthracite to produce 16,323,000 tons of breeze-free metallurgical coke of which 96.42% was blast furnace grade valued at $80.62 (average) per ton. The 12 plants also produced 834,000 tons of coke breeze and byproducts comprising fuel gas, nitrogenous compounds, tar, naphthalene, pitch, and crude light oil and its derivatives.

Electricity Generation.—*Nuclear.*—Duquesne Light Co.'s 90-megawatt nuclear powerplant at Shippingport was taken out of service February 5 for about 2 years because of an explosion of coolant hydrogen within the housing of the electric generator.

Duquesne's president reported in May that Unit No. 1 at the firm's Beaver

Valley nuclear power station would cost $418 million by the time it would be in operation in 1975, and that an identical twin, Unit No. 2, would cost $570 million. Unit No. 2, authorized by the Atomic Energy Commission (AEC) on May 3, was expected to attain commercial operation in 1981. Both units will produce 852 megawatts of electricity from conventional pressurized water reactors.

At an October 16 public meeting before the Advisory Committee on Reactor Safeguards, an AEC licensing project manager testified that operation of the Beaver Valley Unit No. 1 posed no danger to public health if safety plans were followed. Only three major areas of disagreement on safeguards remained between Duquesne and the AEC.

On November 13, PP&L signed a $50 million contract with an Exxon Corp. unit for nuclear fuel assemblies to be used for eight fuel reloadings beginning in 1981 of the twin 1,050-megawatt units at its Susquehanna station near Berwick, Luzerne County. General Electric (GE) will supply the initial fuel loadings for the generating units scheduled for commercial operation in 1980 and 1982.

The Philadelphia Electric Co. shut down its No. 1 40-megawatt gas-cooled nuclear reactor in early June for repairs after discovery of an oil leak in the control rod drive assembly. Peachbottom Units 2 and 3, each rated at 1,065 megawatts with boiler water reactors, began operation in late 1974. Construction costs were first estimated at $250 million and final costs were nearly $900 million.

In June the AEC's Safety and Licensing Board issued an operating license to Philadelphia Electric Co. that permitted the construction of two 1,065-megawatt generating units in Limerick Township. The units located at Pottstown were scheduled for commercial operation in 1981 and 1982. The utility announced in September that it would reduce its construction budget for the 1974–78 period from $3.3 billion to $2.7 billion because of economic conditions.

In May, construction of two nuclear plants on the lower Susquehanna River was up to 5 years behind schedule and estimated final costs were tripled according to the Federal Power Commission (FPC) and the owner-utility companies. Metropolitan Edison Co.'s Unit No. 1 at Three Mile Island was 41 months behind schedule and its Unit No. 2 was 62 months behind schedule. The total cost of the two units, originally estimated at $200 million, was revised to $920 million.

In Pennsylvania there are four operable nuclear electrical generating units, seven under construction, and applications to build two additional units are undergoing AEC review. Total installed nuclear generating capacity is almost 3,200 megawatts or nearly 10% of the Nation's total nuclear generating capability. The nine plants either under construction or under review will add more than 9,000 additional megawatts to the State's nuclear capability by the early 1980's based on current schedules.

Hydroelectric.—In mid-June, the FPC approved a proposed St. Petersburg dam on the Clarion River. The project will provide 420 megawatts of capacity as well as flood control and a recreational area. The proposed dam would inundate the existing Piney 125-foot-high concrete dam that has an installed capacity of 28.8 megawatts.

Fossil fueled.—In late December, the Central Area Power Coordination Group (CAPCO), comprising five Ohio and Pennsylvania electric utilities, announced plans, which had previously been cancelled, to build a $341 million, 825-megawatt coal-fired steam-electric unit at the Shippingport site with completion scheduled for 1979.

On August 1, at the Brunot Island plant of the Duquesne Light Co. three 65-megawatt oil-fired combustion turbines were put into operation to help make up for the loss of generating capacity caused by construction delays at the 852-megawatt Beaver Valley nuclear power station at Shippingport. Hot exhaust gases from the three combustion turbines were used to produce enough steam in heat recovery equipment to generate an additional 148 megawatts of electricity. The use of low-sulfur oil together with other pollution control devices enabled the Brunot Island plant to meet all air and water standards.

At a seminar sponsored by the EPA at Atlanta, Ga., in November, Duquesne's manager of environmental affairs testified that the company will spend about $80 million for equipment to eliminate particulates and sulfur dioxide at its Phillips power station. The process in operation on only two of six boilers produced 7,000

tons of sludge per week, about twice the amount estimated. Although work started on the air pollution control system in September 1970, the work was 1.5 years behind schedule because of faulty materials and delays on delivery of equipment.

On August 7, PP&L said that the company would reduce total construction expenditures from about $4.5 billion to about $3.2 billion over the next 10-year period. Two 800-megawatt oil-fired units being built at Martins Creek were scheduled to attain full operation in 1975 and 1977, but the schedule for two 1,050-megawatt nuclear units being built near Berwick will be rescheduled for completion of one in 1980 and the other in 1982.

Six generating plants originally planned for mid-1980 will be delayed a few years.

Pennsylvania Electric Corp. (Penelec) announced June 14 that it would construct a $350 million, 800-megawatt steam-electric unit near its Seward Station in Indiana County. The new plant will require 2.5 million tons of coal annually. This announcement cancelled plans announced in January to build a $250 million oil-fueled 800-megawatt station near Lake City.

In June, EPA charged four Penelec stations in violation of the Clean Air Act. The stations were located at Seward, Erie, Warren, and Clearfield. A 1,216-foot chimney, the tallest in the United States, was completed at a 650-megawatt plant jointly owned by Penelec and the New York State Electric & Gas Corp. in Homer City. The stack embodied a new approach to meet environmental needs at ground level.

In its Valley Forge Space Sciences Laboratory, General Electric Co. developed a magnetohydrodynamic (MHD) generator that in a series of experiments was able to convert 20% of the heat energy in coal to electricity, a significant increase above the 8% conversion attained by earlier MHD equipment. The experiments indicated that the generator theoretically could reach an efficiency of 30% or higher, which is in the range where MHD power would become practical and useful. The experiments sponsored by GE and the U.S. Office of Naval Research (ONR) produced 1,800 kilowatts of electricity in 0.01-second bursts.

West Penn Power Co., Springdale Borough station was converted to oil from coal at a cost of $3.5 million instead of installing sulfur dioxide wet scrubbing equipment estimated to cost $10.0 million.

The projected use of fuels through 1980 by Pennsylvania electric utilities was reported in an issue of Keystone News Bulletin.[7]

United States Steel Corp. shut down one blast furnace at its Fairless works near Philadelphia in mid-March because of a coal strike in West Virginia. Seven blast furnaces were shut down by United States Steel in the Pittsburgh area by November 25 following a 50% reduction in coke production caused by the coal miners' strike that started November 12. The firm's rolling mills in the Monongahela Valley were affected immediately by the cutback in steelmaking. In March, the firm charged some coal into ovens of the Clairton coke works after spraying the coal with used oils discarded from the firm's nearby steelmaking plants. The oil addition increased the bulk density of the coal charged by 5%.

At the Clairton works, the firm installed experimental coke dust and smoke collecting equipment on the discharge sides of No. 16 and No. 17 batteries of coke ovens. The firm agreed to construct two 165-foot smokestacks at a boilerhouse at the Clairton works at the insistence of the Allegheny County Air Pollution Control Board, which carried its demand to the Commonwealth Court. In mid-year, construction was about 25% complete on a complex for extracting hydrogen sulfide from coke oven gases produced at the Clairton works. The new recovery units will also be capable of converting the hydrogen sulfide into liquid elemental sulfur.

In early November, United States Steel and the United Steelworkers of America agreed on a plan for improving working conditions for 700 workers at the Clairton coke works. One clause of the agreement required an increase in crew size that would add about 130 workers at the coke works.

On November 24, the Occupational Safety and Health Review Commission held United States Steel in violation of a safety regulation requiring control of coal tar pitch emissions at the Clairton works.

In late December, Bethlehem Steel Corp. laid off 200 workers at its Bethlehem plant because of the uncertain coal supply situation.

[7] Keystone News Bulletin. V. 32, No. 6, June 1974, p. 3.

Peat.—At least 90% of the peat found in Pennsylvania occurs in areas north of the glacial terminal moraine. Nine operations in six counties reported a total production of 33,519 short tons, 10.6% more than that in 1973. Of the total production, 33,369 tons was shredded and 150 tons was unprepared. Lackawanna County was the leading producer, followed by Wayne, Luzerne, Erie, Lawrence, and Monroe. Total sales by type are as follows: 11,000 tons of moss peat, 12,519 tons of reed-sedge and 6,815 tons of humus.

Petroleum and Natural Gas.—Annual 1974 Pennsylvania production of crude oil, including lease condensate, totaled 3,478,000 barrels valued at $36,220,000, an increase in output of 6% over that of 1973.

A total of 1,208 wells with a total footage of 2,628,627 feet were drilled in 1974. 1,107 were in proved fields and 101 being listed as exploratory. Six hundred and sixty of the 1,107 wells were oil, 426 were gas, and 21 were listed as dry wells. Exploratory well totalled 11 oil, 42 gas, and 48 as dry as shown in table 16.

Table 16.—Pennsylvania: Oil and gas well drilling completions, by county

County	Proved field wells [1]			Exploratory			Total	
	Oil	Gas	Dry	Oil	Gas	Dry	Wells	Footage
Armstrong	--	14	1	--	1	2	18	55,688
Butler	--	1	1	--	1	2	5	13,800
Cambria	--	1	--	--	--	1	2	7,626
Cameron	--	--	1	--	1	2	4	19,774
Centre	--	--	--	--	--	1	1	7,138
Clarion	--	2	1	--	--	--	3	6,242
Clearfield	--	15	--	--	5	4	24	88,267
Crawford	6	7	--	1	1	4	19	72,358
Elk	--	3	--	--	2	4	9	24,037
Erie	--	--	--	--	3	3	6	20,629
Fayette	--	3	--	--	2	5	10	50,068
Forest	104	--	--	2	--	2	108	91,435
Greene	--	1	--	--	--	--	1	1,733
Indiana	--	321	1	--	12	3	337	1,196,921
Jefferson	1	23	1	1	3	--	29	82,616
Lawrence	--	--	--	--	--	1	1	945
McKean	141	6	7	2	5	2	163	297,015
Mercer	12	2	--	--	--	--	14	21,137
Potter	3	--	--	--	--	4	7	33,748
Somerset	--	--	--	--	1	1	2	14,747
Tioga	--	--	--	--	--	2	2	21,384
Venango	223	1	5	2	1	3	235	188,431
Warren	170	--	3	3	--	--	176	192,256
Washington	--	2	--	--	--	--	2	8,871
Westmoreland	--	24	--	--	4	2	30	111,761
Total	660	426	21	11	42	48	1,208	2,628,627

[1] Development wells as defined by American Petroleum Institute.

Source: American Petroleum Institute.

The No. 1 McLaughlin well in Erie County drilled into the Oriskany sandstone produced an estimated 15 million cubic feet of gas. Two gas discoveries in the Lower Silurian sandstone in Venango County were also significant.

In late March, Bengal Oil and Gas Corp., Midland, Tex., and Energy Minerals Inc. announced immediate commencement of drilling on 10,000 acres of oil and gas leases in northwestern Pennsylvania. Bengal also has eight producing wells in the Ambrose area of Indiana County.

Natural gas production from approximately 17,000 wells in 1974 totaled 82.7 billion cubic feet, an increase of 5% from that of 1973. A total of 69.7 billion cubic feet was produced from the shallow Upper Devonian or younger reservoirs with 13 billion cubic feet produced from the Middle Devonian or older formations. Estimated proven reserves totaled 1,492 billion cubic feet at yearend 1974.

Estimated proven recoverable reserves of crude oil at yearend totaled 50.4 million barrels, an increase of 10.8 million barrels from that of yearend 1973.[5]

[5] Pennsylvania Department of Environmental Resources. Oil and Gas Statistics.
Oil and Gas Journal. V. 73, No. 14, Apr. 7, 1975.

Oil City, where the Nation's first crude oil refinery was built, is experiencing an oil shortage. Quaker State and Pennzoil are paying $10 per barrel as compared to $5 a year ago for Pennsylvania crude. Seventy percent of the crude processed by Quaker State is used to make lubricants, heating oil, and grease; the remaining crude is refined into gasoline.

Deep drilling throughout the State decreased from 69 wells in 1973 to 52 wells in 1974 with the greatest concentration in the Medina gas area of Crawford County where 7 gas wells, 4 oil and gas, and 2 dry holes were drilled. Production of Corning-grade crude from the Medina wells amounted to 57,527 barrels with 258 barrels from wells in Erie County.

Most of the activity in the shallow gas field occurred in Indiana, Westmoreland, Jefferson, Clearfield, and Armstrong Counties, with shallow oil development in Venango from the Red Valley and Venango Second Sandstones, Warren with oil wells in Glade sand, McKean with production from the Second and Third Bradford, and Forest County with oil production from the Red Valley and Venango Second sandstones.[9]

Seismic activities occurred in 28 of the 67 counties of the State with 123 crew-weeks of seismic activity in 1974 as compared to 161 crew-weeks in 1973 for a total cost to operators of $2.5 million.

The Pennsylvania Game Commission leased 12,957 acres in 1974 for exploration or development of oil and gas with a total leased acreage of 45,857 acres involving 43 active leases with 46 active wells on 17 of the 43 leases.

State Forest or Park lands included six tracts leased during the year. First-year rentals for the six tracts totaled over $200,000 with an average leasing cost of $17.28 per acre. After the first year the rental is $1.00 per acre with royalties equal to one eighth of all production. Total income of leased State Forest and Park lands was in excess of $900,000 involving over 280,000 acres.

Abandoned oil and gas wells in the Cook Forest State Park and in the Upper Paint Creek watershed located in Clarion County will be sealed to stop acid pollution of the ground water. Seventy-five percent of the Federal funds will be provided under the terms of the Appalachian Regional Development Act of 1965 with the State providing the remaining 25%.

Pennzoil Co. is using the Maraflood oil recovery process in the previously waterflood oil-wet Bradford third sand reservoir, Bradford field, McKean County, which is an economical process at present-day crude oil prices.

The No. 1 Leonard Svetz wildcat well drilled in Middlecreek Township, Somerset County, by AMOCO Production Co. to a depth of 21,460 feet was plugged and abandoned. This well was the deepest drilled in the Appalachian Basin probably reaching the Gatesburg, Upper Cambrian, which was its target.

Quaker State's Farmers Valley refinery located in McKean County is processing 5,500 barrels of crude per day, 1,350 barrels below capacity. Pennsylvania crude is paraffin-based as compared to most oils, which are asphalt-based. Paraffin-based or "sweet" crude is low in impurities and ideal for high-quality motor oil. Independents supply 80% of the crude mainly from "stripper" wells that produce less than 10 barrels per day. In Pennsylvania the average well produces four-tenths of a barrel per day. A well near Bruin, Butler County, drilled 99 years ago is still producing an average of one-half to 1 barrel per day. About 13 tons of waxes per day used in candlemaking and coating for water-resistant corrugated cardboard are produced at the Farmers Valley refinery.

At the end of 1973, Pennsylvania ranked 13th nationally in "stripper" well production with 31,539 wells producing 3,282,000 barrels per year averaging 0.29 barrels per well. Abandonments totaled 1,951 wells. "Stripper" well reserves listed primarily at 18,390,000 barrels and secondary at 21,323,000 barrels for a total of 39,713,000 barrels.[10]

Owing to a shortage of oil drillers the Tri-County Manpower Administration is training potential drillers at facilities of the Myone Oil and Gas Co. located near Mars. Trainees receive 3 weeks of classroom instruction and 17 weeks in the field. The training program funded by Federal and State monies is one of four such training programs in the United States.

Methane in Pennsylvania coalbeds may supplement commercial supplies of natural

[9] Pennsylvania Department of Environmental Resources. Oil and Gas Statistics.

[10] Oil and Gas Journal. Stripper Reserves Up, Production Down. V. 7, No. 51, Dec. 23, 1974, p. 32.

gas. Researchers estimate 130 billion cubic feet of methane in the Pittsburgh coalbed located in Washington County and 350 billion cubic feet under Greene County. Pennsylvania mines produced an average of 42 million cubic feet of methane per day during mining operations last year. Results of Federal Bureau of Mines coal degasification projects are detailed in Information Circular 8659 and Reports of Investigations 7968 and 7969.

Delaware Bay Transportation Co. plans to install a crude oil line approximately 90 miles in length from the Delaware Bay terminal to Philadelphia.

Northern Border Pipeline, a six-company consortium, plans to construct a 1,600-mile natural gas pipeline costing $1.8 billion from the Montana-Canada border to Delmont, Pa. Construction of the line is contingent upon the Canadian Government approving an Arctic pipeline from Alaska to Montana.

Sun Oil Co. is planning the largest storage area for propane gas, costing $16 million, in the Eastern United States south of Philadelphia. The underground cavern 450 feet below the surface in solid granite will have tunnels 30 feet wide and 40 feet high capable of holding a million and a quarter barrels of propane.

BP Oil Corp. has scheduled a mid-1974 completion date for modernization of Fluid Catalytic Cracking unit costing $5.5 to $6 million, producing refinery products at the Marcus Hook location. BP also has under construction at Marcus Hook a 160-ton-per-day sulfur recovery and tail gas treating plant scheduled for completion in late 1974.[11]

Baumgardner Oil Co., Fayetteville, Pa., has installed a recycle clarifier to increase production of fuel oil reclaimed from used lubricants and similar petroleum wastes from 1,500 to 6,000 gallons per hour with annual production exceeding 7.5 million gallons of fuel oil.

Production of natural gas liquids increased 16% with proved reserves totaling 580,000 barrels at the end of 1974.

Oil spills continue to affect Pennsylvania waterways. A locomotive derailment in the B&O railroad yards in Connellsville caused a break in the locomotive's 3,500-gallon fuel tank allowing 1,500 gallons to flow into a tributary of the Monongahela River. At ARCO's Fort Mifflin depot located in South Philadelphia, the 650-foot Greek oil tanker *Elias* exploded in early April while pumping off its cargo of Venezuelan crude causing an oil spill said to be 3 miles long. Another oil spill totaling 285,000 gallons occurred in late February when the French *Athos* was involved in a collision with another tanker in the Delaware River south of Philadelphia.

In May a Federal administrative law judge ordered Texas Eastern Transmission Corp. not to curtail gas deliveries below 41,240,000 cubic feet daily to Carnegie Natural Gas Co., a subsidiary of United States Steel, on the grounds that curtailment of natural gas would impair the operation of the ammonia plant at Clairton, which produces fertilizer for the agriculture industry and ammonia nitrate for the mining industry. At the end of the year the FPC ordered the Carnegie Natural Gas Co. to reduce the gas delivered to United States Steel by 12 million cubic feet per day. To continue operations United States Steel converted the Duquesne plant from gas to oil.

Columbia Gas of Pennsylvania notified 92 industrial customers in September of a 10% cut in natural gas for a 5-month period and later in the year announced a further reduction totaling 40% to insure adequate gas supplies for residential customers.

Equitable Gas Co. of Pittsburgh announced late in the year a 3-month extension of the 25% cutback to 23 large industrial users in the western part of the State.

Peoples Natural Gas Co. also announced gas curtailments to 224 industrial users in southwest Pennsylvania at the end of the year.

In the northeastern part of the State, Pennsylvania Gas and Water Co. (Penn Gas), Wilkes-Barre, notified industrial users of gas that curtailments may exceed 25%. Industrial leaders estimate 6,200 jobs may be affected by the gas shortage.

On January 16, 1975, Governor Milton J. Shapp proclaimed a "natural gas shortage in Pennsylvania." Homeowners were required to turn down thermostats to 68° F to conserve the natural gas supply to help industries to continue operating without major layoffs.

[11] Chemical Engineering. V. 81, No. 20, Sept. 30, 1974; v. 81, No. 7, Apr. 1, 1974.

NONMETALS

Abrasives.—Metallic abrasives were produced by five companies operating five plants in three cities in three western Pennsylvania counties. Steel shot and grit were manufactured at two plants, annealed iron shot and grit at two others, and one plant manufactured both annealed and chilled iron shot and grit. Leading producers of metallic abrasives were as follows:

In Allegheny County, Abrasive Metals Co., Industrial Corp., and Copperweld Steel Co.; in Butler County, Carborundum Co.; in Westmoreland County, Durasteel Abrasive Co.

Cement.—Portland cement shipments from 19 plants in 8 counties were 13% less in tonnage and 12% greater in value because of an average increase of $5.69 per ton compared with 1973. Masonry cement shipments from 15 plants were 18% less in tonnage but about 1% greater in value because of an average increase in value of $6.80 per short ton. Thirteen companies located in eight counties operated 65 kilns with a total rated maximum 24-hour capacity totaling 28,232 short tons. These plants consumed 103,151,000 cubic feet of natural gas; 732,000 barrels of fuel oil; 1,545,000 tons of bituminous coal; 22,000 tons of anthracite; and 18,676,000 kilowatt-hours of purchased electricity. Pollution control at the kilns consisted of 20 glass bags and 23 electric precipitators. Pennsylvania ranked second among portland cement producing States. Northampton and Lawrence Counties accounted for 54.8% of the total portland cement shipments and 48.4% of the total masonry cement shipments.

Raw materials used in the manufacture of portland and masonry cements totaled 13,549,513 tons and comprised 7,330,216 tons of cement rock, 4,677,381 tons of limestone, 105,623 tons of clay, 214,963 tons of shale, 307,885 tons of sand, 319,722 tons of domestic clinker, 23,438 tons of ferrous materials, 570,285 and tons of other materials.

The mode of transportation, type of packaging, and destinations of finished portland cement shipments is shown in table 18.

National Gypsum Co.'s Evansville plant located near Allentown will have installed a new finish grinding facility and pollution control equipment by early 1975 to comply with health and saftey regulations.

Table 17.—Cement plants in Pennsylvania

Name of plant	Parent company	County	Nearest town	Cement produced [1]	Process
Allentown Cement Div	National Gypsum Co.	Berks	Evansville	P-M	Dry.
		Montgomery	W. Conshohocken	P	Grinding plant.
Bessemer Cement Co	Louisville Cement Co.	Lawrence	Bessemer	P-M	Wet.
Coplay Cement Manufacturing Co.		Lehigh	Coplay	P-M	Dry.
		Northampton	Nazareth	P	Do.
G. & W. H. Corson, Inc	International Utilities.	Montgomery	Plymouth Meeting.	P-M	Grinding plant.
Hercules Cement Co	Amcord, Inc	Northampton	Stockertown	P-M	Dry.
Keystone Portland Cement Co.		do	Bath	P-M	Wet.
Lone Star Industries Inc		do	Nazareth	P-M	Dry.
Marquette Cement Manufacturing Co.		Allegheny	Pittsburgh	P-M	Wet.
Martin Marietta Cement	Martin Marietta Corp.	Northampton	Northampton	P	Dry.
Medusa Cement Co	Medusa Corp	Lawrence	Wampum	P-M	Do.
		York	York (2)	P-W-M	Dry and wet.
The National Portland Co		Northampton	Brodhead	P	Wet.
Penn-Dixie Industries, Inc.		do	Nazareth	P-M	Dry.
		Butler	W. Winfield	P-M	Wet.
Universal Atlas Cement Div.	United States Steel Corp.	Northampton	Northampton	P-W-M	Do.
		Allegheny	Universal	P-M	Dry.
The Whitehall Cement Manufacturing Co.		Lehigh	Cementon	P-M	Do.

[1] M Masonry; P Gray portland; W White portland.

Table 18.—Pennsylvania: Portland cement shipments, by mode of transport and type of package
(Short tons)

Mode of transportation	Plant to terminal		Terminal to consumer		Plant to consumer	
	Bulk	Container	Bulk	Container	Bulk	Container
Railroad	377,944	20,685	1,642	2,869	804,660	45,615
Truck	66,197	3,146	523,909	30,511	5,255,363	773,192
Barge	123,788	--	--	--	9,220	--
Other	--	--	--	--	117	405
Total	567,929	23,831	525,551	33,380	6,069,360	819,212

Clays.—Excluding kaolin, the total production of all clays and shales was 8.2% less in tonnage compared with that of 1973 because of reduced demand. Clays sold or used by producers, by use for 1973–74 are shown in table 19.

Clay-shale samples from six counties in the Greater Pittsburgh Region indicate a promising potential as a source of lightweight aggregate as reported in a Phase IV report of the Pennsylvania Geological Survey in cooperation with the U.S. Geological Survey, State Bulletins M-63 and M-51.

The Bureau of Topographic and Geologic Survey of DER is releasing to open file a detailed compilation of sources of coarse aggregate within a 30-mile radius of Franklin and Warren.

Table 19.—Pennsylvania: Clays sold or used by producers, by use [1]
(Short tons)

Use	1973	1974
Common brick	238,078	53,495
Face brick	1,378,052	1,417,532
Firebrick, block, shapes	750,534	707,966
Flue linings	52,236	41,444
Brakes, clutches, linoleum, other fillers	1,858	3,128
Lightweight aggregate	80,000	W
Mortar and cement, refractory	14,286	12,948
Portland and other cements	224,532	172,432
Pottery	490	192
Sewer pipe	98,892	101,988
Floor and wall tile, ceramic	--	6,000
Drain, quarry, structural tile	29,234	33,947
Other uses [2]	41,706	113,853
Exports:		
Face brick	28,171	28,984
Refractories	8,949	9,087
Sewer pipe	28,170	28,984
Total	2,975,188	2,731,980

W Withheld to avoid disclosing individual company confidential data; included with "Other uses."
[1] Excludes kaolin.
[2] Includes high alumina refractories, refractory grogs and crudes (1973); terra cotta; and data indicated by symbol W.

Graphite.—Three companies collectively produced synthetic graphite used for electric motor brushes and machined shapes, pyrolytic graph plate, and crucibles and vessels. The principal raw materials used for synthetic graphite comprised petroleum coke, lampblack, pitch coke, black oil, hydrocarbon gases, and unspecified additives.

Gypsum.—Crude gypsum was not produced in Pennsylvania during 1974, but was calcined at the United States Gypsum Co. Philadelphia plant. Output and value were approximately 32% less than that in 1973.

Iodine.—Inorganic and organic iodine compounds were produced from crude iodine by the Foote Mineral Co., near Frazer, Chester County; the Whitmoyer Laboratories, Inc., near Myerstown, Lebanon County; and the West Agro-Chemical Inc., near Eighty Four, Washington County.

Lime.—Eight companies produced lime

at 10 plants in 8 counties. Leading counties were Centre, Lebanon, and Butler. Leading producers were Bethlehem Mines Corp. in Adams and Lebanon Counties, Warner Co. in Centre and Chester Counties, and Marblehead Lime Co. in Centre County. Output decreased 8% below the 1973 record, to 2.1 million tons. Among the States, Ohio ranked first and Pennsylvania second in lime production. The lime was used for basic oxygen steel furnaces, water purification, refractory dolomite, electric steel furnaces, and other uses. The lime was consumed in Pennsylvania, Maryland, Ohio, New Jersey, and other destinations. Consumption of lime in Pennsylvania was 2,350,000 tons.

Mullite.—The Remmey Div. of A. P. Green Refractory Co. in Philadelphia County produced high-temperature synthetic mullite.

Perlite.—Crude perlite was shipped into the State and expanded at plants operated by five companies in six counties as compared with seven plants in 1973. Production in 1974 totaled 38,204 tons valued at $2,683,849 and averaged $70.25 per ton. Expanded perlite was sold or used chiefly for roof insulating board and other formed products.

Sand and Gravel.—One hundred and one companies produced sand and gravel at 111 operations in 42 counties. Leading producers were Bucks, Armstrong, Erie, and Beaver Counties, which accounted for 39% of the total quantity and 38% of the total value. The quantity of sand and gravel produced was 12% less, but its value was 5% greater than that in 1973. Average value increased from $2.08 in 1973 to $2.50 per ton.

Of the total sand and gravel produced in 1974, 13,189,000 tons valued at $33,762,000 were sold or used commercially by producers as construction and industrial sand and gravel, the remaining 4,882,000 tons valued at $11,419,000 were sold for publicly funded projects. Nearly one-half of the construction aggregate for public projects went for bituminous paving with highway and bridge construction accounting for 31% of the total, which is shown in table 22.

Table 20.—Pennsylvania: Construction and industrial sand and gravel sold or used by producers
(Thousand short tons and thousand dollars)

Use	1973		1974	
	Quantity	Value	Quantity	Value [1]
Construction:				
Processed:				
Sand	18,621	36,211	8,949	20,922
Gravel			7,359	16,838
Unprocessed: Sand and gravel			664	673
Industrial:				
Sand	1,955	6,619	1,099	6,508
Gravel			--	--
Total	20,576	42,830	18,071	44,941

[1] Value data may not be directly comparable to that in tables 1, 21, and 22 because unit value of construction aggregate may be higher than the individual unit values for sand or gravel.

Table 21.—Pennsylvania: Construction aggregate and industrial sand and gravel sold or used commercially by producers
(Thousand short tons and thousand dollars)

Use	1973		1974	
	Quantity	Value	Quantity	Value [1]
Construction aggregate:				
Nonresidential and residential construction			5,639	12,977
Highway and bridge construction			749	1,939
Other uses (dams, waterworks, airports, etc.)			257	822
Concrete products (cement blocks, bricks, pipe, etc.)	16,229	32,692	2,437	5,687
Bituminous paving (asphalt and tar paving)			1,219	2,738
Roadbase and subbase			778	1,623
Unprocessed aggregate			661	671
Fill	585	645	160	346
Other uses [2]	1,808	2,874	190	451
Industrial sand and gravel	1,955	6,619	1,099	6,508
Total	[3]20,576	42,830	13,189	33,762

[1] Unit value of construction aggregate may be higher than the unit value of sand or gravel.
[2] Includes miscellaneous (1973).
[3] Data do not add to total shown because of independent rounding.

Table 22.—Pennsylvania: Construction aggregate sold or used for publicly funded projects by producers
(Thousand short tons and thousand dollars)

Use	1974	
	Quantity	Value [1]
Construction aggregate:		
Nonresidential and residential construction	195	440
Highway and bridge construction	1,559	3,510
Other uses (dams, waterworks, airports, etc.)	129	292
Concrete products (cement blocks, bricks, pipe, etc.)	W	W
Bituminous paving (asphalt and tar paving)	2,012	5,487
Roadbase and subbase	696	1,147
Unprocessed aggregate	W	W
Fill	42	89
Other uses	249	454
Total	4,882	11,419

W Withheld to avoid disclosing individual company confidential data; included with "Other uses."
[1] Unit value of construction aggregate may be higher than the unit value of sand or gravel.

The Monongahela and Ohio Dredging Co. of Pittsburgh, retained by the Municipal Authority of New Kensington to dredge away silt clogging its water intakes on the Allegheny River, was dumping the silt into a trench 100 feet long, 40 feet wide, and 25 feet deep causing turbidity in the river and was ordered to stop operations by DER officials.

A Federal-State study concluded that dredging for sand and gravel in the upper Allegheny River is harming fish life. Four firms employing approximately 60 people are currently dredging. In early May, the State Environmental Hearing Board ruled that dredging permits for 1974–75 be issued to the Oil City Sand and Gravel Co. and Warren Sand and Gravel Co. and a permit be issued to the Davison Sand and Gravel Co. for the remaining part of 1974. Several conservation organizations are seeking an end to dredging and the inclusion of the upper Allegheny in the Wild and Scenic Rivers system.

Hummelstown residents located near Harrisburg are concerned with blasting vibrations from the nearby Pennsy Supply Companies quarries. The National Crushed Stone Association's noise and vibration committee is studying more effective ways to control blasting damage vibrations

Stone.—Pennsylvania was the country's leading stone producer. Adams, Berks, Bucks, Chester, Lancaster, Lebanon, Montgomery, Northampton, and York Counties each produced over 3 million tons. Collec-

tively, these nine counties accounted for 57.6% of the total quantity and 57.0% of the total value. The total output of the 52 producing counties was 6.9% less, but its total value was 6.1% greater than that in 1973. The average value in 1973 was $1.91 per ton as compared to $2.18 in 1974.

Dimension stone produced at 31 quarries in 11 counties accounted for 0.11% of the total tonnage and 3.2% of the total value of all stone produced. The average value of all dimension stone increased to $62.29 per short ton from $45.77 in 1973. The type of dimension stone and the number of producing quarries were as follows: Sandstone 19, slate 7, other stone 3, quartzite 1, and granite 1.

Dimension quartzite, sandstone, and other stone were used primarily for irregular shapes and sawed stone. Slate was primarily used for blackboard and flagging. Slate accounted for 38.4% of the total production of dimension stone and 75.0% of its total value.

Crushed and broken limestone accounted for 73.46% of the tonnage and 72.71% of the total value of crushed and broken stone. The percentage distribution by use of the crushed and broken limestone was as follows: Road aggregates and road-base stone 65.53%, cement manufacture 13.88%, flux stone 5.6%, lime manufacture 6.05%, agricultural uses 2.08%, and all other uses 6.93%. Crushed and broken stone was transported as follows: Truck 83.8%, railroads 7.9%, waterways 2.4%, and other methods 5.9%.

Table 23.—Pennsylvania: Stone sold or used by producers, by county

(Thousand short tons and thousand dollars)

County	1973			1974			Kind of stone produced in 1974
	Number of quarries	Quantity	Value	Number of quarries	Quantity	Value	
Allegheny	3	W	1,122	2	W	351	Sandstone.
Armstrong	5	174	478	4	165	461	Limestone.
Berks	16	5,352	7,983	14	4,180	7,908	Limestone, sandstone, traprock.
Blair	7	1,368	2,559	6	W	3,469	Limestone, dolomite, quartzite.
Bucks	15	5,026	9,902	16	5,174	11,463	Limestone, sandstone, traprock, other stone.
Butler	7	2,004	5,111	7	2,001	5,972	Limestone, sandstone.
Centre	9	2,830	6,226	8	2,910	6,213	Limestone.
Chester	8	4,137	7,311	9	3,803	7,435	Limestone, granite, quartzite, sandstone.
Clarion	4	302	789	4	286	W	Limestone, sandstone.
Cumberland	7	1,947	3,465	7	1,725	3,520	Do.
Dauphin	7	2,630	3,957	3	1,611	3,136	Do.
Fayette	6	W	W	7	1,246	3,284	Limestone, quartzite.
Huntingdon	5	764	1,510	7	W	1,557	Do.
Jefferson	--	--	--	1	35	70	Sandstone.
Juniata	1	275	432	--	--	--	
Lancaster	17	5,696	10,883	17	5,308	11,681	Limestone, dolomite, other stone.
Lawrence	5	1,505	2,622	4	1,442	3,413	Limestone.
Lehigh	9	2,631	4,106	9	2,821	4,815	Limestone, slate.
Luzerne	4	1,039	1,713	4	1,253	2,926	Sandstone.
Monroe	3	W	W	3	769	1,574	Limestone, other stone, sandstone.
Montgomery	14	7,156	13,728	13	6,608	14,105	Limestone, dolomite, granite, other stone, traprock.
Northampton	18	5,757	10,912	17	5,005	10,873	Limestone, dolomite, slate.
Northumberland	3	480	1,029	3	481	922	Limestone, sandstone.
Potter	3	1	30	3	1	W	Sandstone.
Somerset	5	690	W	5	W	W	Limestone, sandstone.
Susquehanna	7	W	724	8	W	916	Sandstone.
Wayne	2	W	W	2	393	843	Do.
Westmoreland	8	2,178	4,951	8	2,046	5,051	Limestone, sandstone.
York	10	4,461	10,339	10	4,670	11,647	Limestone, dolomite, sandstone.
Undistributed [1]	47	20,162	38,461	50	19,158	36,008	Limestone, quartzite, sandstone, traprock, other stone.
Total [2]	255	78,564	150,346	251	73,092	159,615	

W Withheld to avoid disclosing individual company confidential data; included with "Undistributed."

[1] Includes Adams, Bedford, Cambria, Carbon, Clinton, Columbia, Delaware, Elk, Franklin, Fulton, Greene (1973), Indiana (1974), Lackawanna, Lebanon, Lycoming, McKean, Mercer, Mifflin, Montour, Perry, Pike (1974), Schuylkill, Snyder, Tioga (1974), Union, and Washington (1973) Counties, and production for which no county breakdown is available.

[2] Data may not add to totals shown because of independent rounding.

Table 24.—Pennsylvania: Stone sold or used by producers, by use

(Thousand short tons and thousand dollars)

Use	1973		1974	
	Quantity	Value	Quantity	Value
Dimension stone:				
Building stone [1]	59	895	39	962
Curbing and flagging	22	634	21	782
Other uses [2]	23	3,277	23	3,469
Total [3]	105	4,806	84	5,213
Crushed and broken stone:				
Bituminous aggregate	7,561	15,301	7,019	15,170
Concrete aggregate	7,363	13,331	5,933	12,086
Dense graded roadbase stone	20,731	34,897	20,026	39,813
Macadam aggregate	1,624	2,960	1,370	2,720
Surface treatment aggregate	3,460	5,284	3,411	6,344
Unspecified construction aggregate and roadstone	11,540	21,759	10,088	19,538
Agricultural purposes [4]	1,499	5,104	2,080	7,366
Cement manufacture	12,045	16,685	10,136	16,633
Lime manufacture	3,634	8,443	4,422	9,862
Filter stone	236	W	264	W
Flux stone [5]	4,087	9,357	4,117	10,521
Glass	90	W	W	W
Manufactured fine aggregate (stone sand)	427	1,167	901	2,611
Mineral fillers, extenders, whiting	728	3,092	267	2,388
Railroad ballast	1,738	2,944	1,033	2,369
Refractory stone	W	W	78	1,045
Riprap and jetty stone	956	1,813	709	1,553
Special uses and products [6]	141	754	113	846
Other uses [7]	601	2,648	1,042	3,536
Total [3]	78,459	145,540	73,008	154,402
Grand total	78,564	150,346	73,092	159,615

W Withheld to avoid disclosing individual company confidential data; included with "Other uses."

[1] Includes rough blocks (1973), rough construction stone, cut stone, house stone veneer, and dressed construction stone.

[2] Includes roofing slate, millstock, flooring slate, and other uses not specified.

[3] Data may not add to totals shown because of independent rounding.

[4] Includes agricultural limestone and poultry grit and mineral food. 1973 data also include other soil conditioners.

[5] Data include dead-burned dolomite.

[6] Includes mine dusting and abrasives.

[7] Includes stone used in acid neutralization and uses not specified. 1974 data also include chemical stone for alkali works, building products, fill, and waste material.

Sulfur (Recovered).—Four petroleum refineries operated by four companies in Delaware and Philadelphia Counties produced 25,703 long tons of sulfur. Shipments totaling 25,536 long tons averaged $25 per long ton. There was no hydrogen sulfide or sulfur dioxide produced in Pennsylvania during the year.

Tripoli (Rottenstone).—Crude tripoli was produced at one mine in Lycoming County and prepared material sold as filler.

Vermiculite (Exfoliated).—Vermiculite was shipped into the State and exfoliated by Hyzer & Lewellen at Southampton, Bucks County; by W. R. Grace & Co. at New Castle; and by J. P. Austin Associated Inc. in Beaver Falls. The vermiculite was used in horticulture, block fill insulation, pool base, soil conditioner, castable, cryogenic, fertilizer carrier, and plaster aggregate.

METALS

Aluminum.—At the Aluminum Co. of America (Alcoa) Logans Ferry works, 18 employees of the atomizing plant that converts aluminum to a fine powder for paint pigment may be moved to another location because of difficulties in meeting Allegheny County particulate limits. Alcoa also announced in October that an additional 136 employees would be laid off at its Cressona plant near Pottsville bringing the total of laid off employees for the year to 265 due to declining demand for aluminum extrusions.

Beryllium.—After a 2-week strike of 39 technicians in early July, supported by approximately 400 hourly employees of Local 2317 United Steel Workers of America who refused to cross the picket line, operations resumed at the Kawecki-Berylco Industries plant in Reading.

Cadmium.—Smelter production of cadmium decreased 11% in 1974 and value decreased 0.5% as compared with that of 1973 owing to higher product prices. Nationally, Pennsylvania ranked third behind Oklahoma and Colorado in production.

Carbide.—*Silicon Carbide.*—One company in Allegheny County produced artificial abrasives and silicon carbide. Satellite Alloy Corp., Springdale Borough, a producer of silicon carbide was assessed $1,000 under the County Air Pollution Code for failing to have baghouses installed by April 1974 to control air pollution.

Tungsten Carbide.—Kennametal Inc., a hard carbide alloys producer located near Latrobe, expects to spend about $15 million for plant and equipment additions during the year, more than twice the $6 million spent last fiscal year. Additions in Pennsylvania include 10,250 square feet of floor space at the Chestnut Ridge plant for new furnaces; 12,000 square feet at the Kingston plant for new furnaces and powerplant facilities; and new additions to the Bedford plant in fiscal year 1975 to increase output of mining tools.

Ferroalloys.—Nationally Pennsylvania ranked second in the production of ferroalloys. During the year Pennsylvania produced 271,128 tons valued at $96,673,000 as compared with 454,143 tons valued at $96,967,000 in 1973.

Iron Oxide Pigments.—Three plants produced iron oxide pigments in Pennsylvania during 1974. One plant located in Allegheny County produced crude red iron oxide while two plants in the eastern part of the State produced both natural and manufactured iron oxide pigments consisting of brown, red, yellow, and black grades.

Iron Ore.—Bethlehem Mines Corp.'s Cornwall mine No. 3 and No. 4 were permanently closed as a result of flooding caused by Hurricane Agnes in June 1972. Bethlehem is currently operating the Grace underground mine located near Morgantown, Berks County.

Early in September, Bethlehem Steel Corp. announced that the Cornwall plant, located in Lebanon County, that had been closed in 1973 would be reopened to pelletize an estimated 750,000 tons of ore per year for the Steelton and Bethlehem plants.

Production in 1974 at Bethlehem's Grace mine totaled 1,312,896 net tons of pellets and 1,284 net tons of low-grade chalcopyrite. Approximately 494,650 pounds of dynamite and 164,300 pounds of Nylite #303 were used during the year.

Iron and Steel.—Shipments of pig iron in Pennsylvania in 1974 totaled 21.77 million tons valued at $2,577,311,000. At the beginning of 1974, 36 blast furnaces were operating and 17 were out of blast for a total of 53 furnaces as compared to 34

operating furnaces and 16 idle at the end of December. Types of pig iron produced were basic, bessemer, malleable, and direct castings having an average value per short ton of from $116.14 to $125.24 as shown in table 25.

Table 25.—Pennsylvania: Pig iron production, shipments, and stocks in 1974

Type	Production (short tons)	Shipments (short tons)	Value	Average value
Basic	20,569,506	20,650,081	$2,442,304,397	$118.27
Bessemer	673,733	672,377	78,090,000	116.14
Malleable	451,515	454,125	56,875,300	125.24
Direct castings	332	332	41,294	124.38
Total	21,695,086	21,776,915	2,577,310,991	118.35

During the first week in May steelmakers in the Pittsburgh district set an alltime weekly record high of 475,000 tons of raw steel or 123% of the 1967 average, which is within 1% or 2% of theoretical capacity in the area. Production is expected to drop slightly owing to relining of furnaces in the coming months.

Financing for pollution control projects by United States Steel is through tax-free bonds approved by the Industrial Development Authority (IDA) of Allegheny County. On February 7, IDA had approved an $850,000 wet electrostatic precipitator at the United States Steel Duquesne works while the County Air Pollution Variance Board had granted an extension on emission controls until June 8, 1974, for two basic oxygen furnaces, one at Duquesne and the other at Edgar Thomson. At United States Steel's Clairton works, a $3 million enclosure for "coke wharves" on the discharge side of the No. 17 coke battery will be installed to control emissions. The exhaust gas cleaning project at the Homestead works will involve installation of 19 new dust collection hoppers on the electric precipitators and new equipment to increase the fan capacity. United States Steel's $27 million waste water treatment plant at the Clairton works capable of cleaning 2.5 million gallons of process water daily will be completed in 1975. The Environmental Protection Agency has requested information from both United States Steel and Bethlehem on steel production waste water treatment processes and costs in connection with future effluent guidelines for the industry.

Environmental experts from four of the major steel producing companies have indicated difficulties in complying with the Clean Air Act and suggest compliance be extended for a 3-year period. In September the Commonwealth Court issued an order to United States Steel to prove that it cannot meet key provisions of the air pollution agreement signed with county and State officials 2 years ago. In early October, United States Steel was fined a total of $4,088 after losing an argument in an air pollution case that technical equipment is more reliable than the human eye.

At Bethlehem's Johnstown plant, officials predict a phasing out of the operation, but relaxed State pollution control requirements with a company investment of $100 million in pollution control equipment could keep the plant operating until 1983, with some facilities shutting down at an earlier date. Meanwhile EPA and DER have ordered Bethlehem to reduce by about 90% the pollution discharged into the Conemaugh River. Bethlehem announced plans for a $3.75 million water pollution control system on the blast furnace making ferromanganese and the installation by 1978 of two modern, efficient basic oxygen furnaces (BOF) enabling the Johnstown plant to maintain its capacity at about 2.3 million tons of raw steel per year; the cost of the BOF furnaces were not made available by Bethlehem.

At the Steelton plant a second baghouse dust control system is being installed at the plant's electric furnace melt shop. The new baghouse is 206 feet long, 80 feet wide, and 123 feet high and operates much like a home vacuum cleaner. In December, 750 of the 17,000 employees of the Bethlehem plant were idled due to a shortage of coal resulting from contract negotiations between the coal producers and the UMWA.

Jones & Laughlin's (J&L) Hazelwood plant was fined $100,000 by the County Health Department's Air Pollution Control Bureau for violation of pollution standards and failing to begin construction of desulfurization control equipment by March 1, 1974. J&L plans to appeal the fine. In November, J&L pleaded guilty to two air pollution charges involving excessive smoke discharges from the plant and was fined a total of $700 by a justice of the peace. In another pollution case J&L's Hazelwood plant was found not responsible for naphthalene entering the water intakes of Western Pennsylvania Water Co.'s Becks Run plant, but J&L was found guilty of a 90-minute leak of naphthalene from a crack in the service trench on October 30 resulting in violation of the State's Clean Stream law.

Crucible Steel plans to limit the amount of cyanide discharged into the Ohio River from its Midland plant, to build a treatment plant to handle all waste discharges from the hot and cold strip mills, and to limit its discharge of phenols into the river to less than 100 pounds per day.

Wheeling-Pittsburgh Steel Corp. has agreed to limit discharges of cyanide and phenols into the Monongahela River from its Monessen plant and to construct a partially closed water pollution control system to prevent discharges from coke ovens and blast furnaces into the river.

Allegheny Ludlum Steel Corp. completed a $1.7 million water reclamation system at its Brackenridge plant that returns the used water to the Allegheny in a pollution-free condition.

Lukens Steel Co., Coatesville, started operation in early February of a new 150-ton-capacity electric furnace equipped with a direct evacuation dust control system, a secondary canopy system, a new baghouse, and a closed-loop water system costing $20 million.

J&L Steel Corp., the Nation's sixth largest steel producer, announced in March a new method of shrouding the liquid steel being poured into a continuous casting machine that prevents harmful oxidation of the steel. The "Pollard shroud" is being used at the Aliquippa works. In early May J&L announced a $200 million program for the Aliquippa works to be completed in 2 to 4 years, which would add 1 million tons to the plant's present 4-million-ton capacity by adding equipment to increase output of the BOF furnace, installing a second blooming mill, adding tubular products finishing facilities, and improving coke ovens and blast furnaces. Other J&L improvements include a contract to Wean United for a plant to process and regenerate pickle liquor at an out-of-State operation, a contract with Eichleary Corp. for demolition of an open hearth at the Aliquippa works, and the dismantling of an existing soaking pit by Swindell-Dressler Co.

J&L will discontinue production of "general line" cold-rolled steel sheet at the Pittsburgh works by December 1, but this line will be continued at other more modern company plants.

One of the United States Steel's Duquesne blast furnaces built in 1890 is being dismantled and remelted at a nearby BOF. Other changes included phasing out of the seamless tube mills at Ellwood City with consolidation at the Gary, Ind., plant, and banking a blast furnace at the National Tube Works located in McKeesport because of the coal strike.

United States Steel will have relining complete on its "Dorothy" furnace by late September while emergency repairs to furnace bells were made at one furnace located at the Homestead works. Relining of another furnace at the Edgar Thomson works took place in November, and the company also announced a second furnace to be banked at Edgar Thomson and two others at the Clairton works devoted to making ferromanganese. By late November, United States Steel had banked 17 blast furnaces with coke production reduced by over 50%.

Steel production in the Pittsburgh district continued to drop during the latter part of the year because of the coal strike. Wheeling-Pittsburgh Steel will shut down the largest blast furnace at the Monessen works for 2 months for relining.

Bethlehem Steel Corp. announced relining of a furnace located in Bethlehem, Pa.

Bethlehem announced in early July plans for installation of two electroslag remelt (ESR) furnaces at its Bethlehem plant. The furnaces will produce steel ingots in various alloys, up to 60 inches in diameter and weighing a maximum of 150,000 pounds, for the electrical industry, which requires improved quality material.

Universal Cyclops Specialty Steel Div.,

Cyclops Corp., has also purchased an ESR furnace to be installed at its Bridgeville plant, that will double output of electroslag refined specialty alloys; production is scheduled for late 1975.

Lukens Steel's Coatesville, Pa., plant has recently installed an ESR furnace producing over 140 heats without requiring any maintenance or repairs.

In Reading, Pa., Carpenter Technology Corp. has awarded Dravo Corp. a contract for the design and fabrication of an ESR furnace, which will give Carpenter three such furnaces. Dravo is the exclusive licensee in the United States and Canada for Behr Boehler and Co., Vienna, Austria, developer of the ESR furnaces.

In October, Armco Steel Corp. announced plans to increase iron and steel production at its Ashland, Ky., plant by one-half million tons per year with a substantial portion to be shipped to its Butler and Ambridge, Pa., plants. The Ambridge plant will increase tubular products for oil and gas drilling by 40,000 tons a year.

Babcock and Wilcox's Tubular Products Div. located at Beaver Falls has a new 25-ton-per-cycle argon-oxygen refining unit used to refine stainless steels plus other high-chromium and chrome-containing alloys vital to production of steel tubular products. An electroslag remelting furnace is also being installed as part of the modernization program. Late in the year the DER ordered the Tubular Products Div. to convert 3 of the plant's 11 boilers that used 2% sulfur coal for the past 26 years to oil or gas. The other eight boilers are currently fueled by either oil or gas.

In August, Lukens announced an improvement and expansion program to meet customers' requirements for heavy, heat-treated, alloy plate steel costing $14 million.

The Washington Steel Corp. located at Washington has contracted for $18 million a construction project for a new hot rolling mill and related equipment. In Pittsburgh the Pittsburgh Forgings Co. purchased the Janney Cylinder Co. of Philadelphia, a major producer of metals castings by a centrifugal process, for approximately $2.5 million.

The Alan Woods Steel Co. Conshohocken plant producing about 1.2 million tons of steel plate a year was shut down between May 1 and May 25 while a new labor contract was being negotiated. In early July, Alan Woods began to convert or roll semi-finished steel for several other mills because of additional plant rolling capacity. A $7 million project to boost the plant's ironmaking capacity from 2,038 tons to 2,248 tons, or a 11% increase, by replacing three air heating stoves and installing a new car damper was announced in late July of 1974 and in August. Creusot-Loire, a French steel producer, obtained a 10% interest in the Conshohocken plant, which is the first such investment in an American steel company according to steel industry sources.

To meet future needs of the steel industry, Chemetron Corp.'s Sharon, Pa., plant is being expanded to add 250 tons of liquid oxygen, nitrogen, and argon and 215 tons of gaseous oxygen and nitrogen per day to bring the plant's total daily capacity to over 1,200 tons.

NVF Co., which currently owns about 85% of Sharon Steel Co. stock, is considering acquisition of the remaining 15% resulting in the merger of a NVF subsidiary with Sharon Steel and the issuance of a new series of subordinated debentures in exchange of outstanding Sharon common stock.

The beginnings of the steel industry can be traced to the 500 iron furnaces scattered throughout the eastern half of the United States. Over 200 years ago the Cornwall and Hopewell Furnaces were the early iron producers in Pennsylvania. The Cornwall Furnace is now operated by the Pennsylvania Historical and Museum Commission while the Hopewell Furnace, located south of Birdsboro, Pa., is being restored by the National Park Service and it will play an important role in the Nation's 200th birthday celebration in 1976. Recently Bethlehem Steel Corp. donated to the Hopewell Furnace 250 tons of iron ore from the nearby abandoned Cornwall Mine which introduces more realism into the restoration of early iron industry in Pennsylvania.

In western Pennsylvania, the Laurel Hill Furnace built in 1845 and located in Westmoreland County was given to the Western Pennsylvania Conservancy by the Charles L. Reidenour family of New York State to be used as a historical monument when transferred to the Pennsylvania Historical and Museum Commission.

Lead.—St. Joe Minerals Corp. will test

the Queneau-Schuhman (Q-S) process for direct production of lead bullion from sulfide concentrates at its research center in Monaca. The Q-S process eliminates sintering and blast furnace operations by continuously converting galena mineral to lead bullion in a single bottom blown reactor.

Nickel.—The Westinghouse Specialty Metals Div., employing about 400 people at Blairsville, will spend $8.5 million to double the size of the special nickel alloy tube mill that manufactures tubing (Westro) used in nuclear steam generators. Last year an expansion took place in the Zircolay seamless tubing division that manufactures tubing or fuel rods containing pellets of uranium dioxide for nuclear reactor core fuel assemblies.

Silver-Copper.—The Hussey Metals Div. of Copper Range Co., Leetsdale, plans to sell a new super silver-copper alloy, No. 155, comprised of 99.8% copper, 0.04% silver, 0.05% phosphorus, and 0.11% magnesium, which possesses strength and thermal, electrical, and mechanical properties not previously available.

Uranium.—Exxon Corp. is considering exploration for uranium on State Game Lands in Luzerne and Carbon Counties, but sportsmen in that area are opposed to exploration, which may open the land to extensive mining and reduce hunting areas.

Zinc.—New Jersey Zinc Div. of Gulf & Western Industries plans to modernize its Palmerton zinc plant which includes improved mix houses, changes in the roasting and acid plants, mechanization of bagroom oxide handling, revisions of materials handling systems, and new dust control facilities in addition to increases in production capacity for the French process and American process zinc oxide operations.

At the other end of the State, the St. Joe Minerals Corp. Monaca zinc smelter had difficulties meeting the State's air pollution standards and has appealed DER's regulations.

The State's production of primary zinc came from the New Jersey Zinc underground Friedensville mine near Bethlehem where a zinc sulfide replacement ore body in dolomitic limestone was mined by the open slope and room-and-pillar methods. This mine is ranked eighth in the Nation in order of output.

Pennsylvania ranks seventh in the Nation producing 20,288 short tons of zinc valued at $14,567,000, a production increase of 7.5% over 1973. The unit price for zinc in 1974 was $0.3590 per pound or $718.00 per ton.

Pennsylvania Geological Survey data shows a limonite sample taken in an abandoned iron mine in the Beekmantown Group of Blair County to contain 1.6% zinc. Trace element analyses of limonite occurrences in approximately 50 abandoned iron mines of central and southeastern Pennsylvania suggest the presence of zinc.

Table 26.—Pennsylvania: Principal producers

Commodity and company	Address	Type of activity	County
Abrasives: Satellite Alloy Corp.	9800 McKnight Rd. Pittsburgh, Pa. 15237	Plant	Allegheny.
Cement:			
Amcord, Inc.[1]	610 Newport Center Dr. Newport Beach, Calif. 92660	do	Northampton.
Coplay Cement Manufacturing Co.[1]	Nazareth, Pa. 18064	do	Lehigh and Northampton.
Keystone Portland Cement Co.[2]	Box 1785 Allentown, Pa. 18105	do	Northampton.
Louisville Cement Co	501 South Second St. Louisville, Ky. 40202	do	Lawrence.
Medusa Corp.[1 2]	Box 5668 Cleveland, Ohio 44101	do	Lawrence and York.
Penn-Dixie Industries, Inc.[1 2]	60 East 42d St. New York, N.Y. 10017	do	Butler and Northampton.
United States Steel Corp.[1 3]	600 Grant St. Pittsburgh, Pa. 15230	do	Allegheny and Northampton.
Clays:			
Dresser Industries, Inc	P.O. Box 6504 Houston, Tex. 77005	Pit	Clearfield and Somerset.
Glen-Gery Corp	227 North 5th St. Reading, Pa. 19601	Pit	Adams, Berks, Northumberland, Union, York.
Hanley Co	28 Kennedy St. Bradford, Pa. 16701	Pit	Jefferson and McKean.
Resco Products	Box 108 Morristown, Pa. 19404	Pit	Clearfield and Huntingdon.
Coal, anthracite:			
Greenwood Stripping Corp	1 Venice St. Nesquehoning, Pa. 18240	Strip	Carbon and Schuylkill.
Jeddo-Highland Coal Co	800 Exeter Ave. West Pittston, Pa. 18643	Strip and culm bank.	Luzerne.
Leon E. Kocher Coal Co	Box 127 Valley View, Pa. 17983	Underground	Schuylkill.
Reading Anthracite Co	200 Mahantongo St. Pottsville, Pa. 17901	Culm bank and strip.	Northumberland and Schuylkill.
Coal, bituminous:			
Barnes & Tucker Co	357 Lancaster Ave. Haverford, Pa. 19041	Underground	Cambria.
Bethlehem Mines Corp.[4]	701 East 3rd St. Bethlehem, Pa. 18016	do	Cambria and Washington.
C&K Coal Co	Box 69 Clarion, Pa. 16214	Strip	Clarion.
Pittsburgh Coal Co	Box 500 Library, Pa. 15129	Underground	Washington.
Graphite, synthetic:			
Air Reduction Co., Inc	Theresia St. St. Marys, Pa. 15857	Plant	Elk.
Charles Pfizer & Co., Inc.[1]	235 East 42d St. New York, N.Y. 10017	do	Northampton.
Stackpole Carbon Co	St. Marys, Pa. 15857	do	Elk.
Gypsum, calcined: United States Gypsum Co.[5]	101 South Wacker Dr. Chicago, Ill. 60606	do	Philadelphia.
Iron oxide pigments:			
The Prince Manufacturing Co.	Bowmanstown, Pa. 18030	do	Carbon.
Reichard-Coulston, Inc	15 East 26th St. New York, N.Y. 10010	do	Northampton.
Lime:			
Bethlehem Mines Corp	701 East 3rd St. Bethlehem, Pa. 18016	do	Adams and Lebanon.
Marblehead Lime Co	300 W. Washington Chicago, Ill. 60606	do	Centre.
Warner Co	1721 Arch St. Philadelphia, Pa. 19103	do	Centre and Chester.
Peat:			
Gouldsboro-Wayne Peat Co	Box 68 Gouldsboro, Pa. 18424	Moss	Wayne.
Lake Benton Peat Moss	1418 North Main St. Scranton, Pa. 18508	Bog	Lackawanna.
Perlite, expanded:			
Armstrong Cork Co	Lancaster, Pa. 17603	Plant	Lancaster.
Atlantic Perlite	Box 345 Primose, Pa. 19018	do	Delaware.
Pennsylvania Perlite Corp	Box 2002 Lehigh Valley, Pa. 18001	do	Lehigh and York.

See footnotes at end of table.

Table 26.—Pennsylvania: Principal producers—Continued

Commodity and company	Address	Type of activity	County
Perlite, expanded —Continued			
Perlite Manufacturing Co	Box 478 Carnegie, Pa. 15106	Plant	Allegheny.
Petroleum refineries [6]			
Sand and gravel:			
Davison Sand & Gravel Co	34th Ave. and 4th St. New Kensington, Pa. 15068	Dredge	Westmoreland.
Dravo Corp	One Oliver Plaza Pittsburgh, Pa. 15222	---- do	Beaver.
Erie Sand Steamship Co	Erie, Pa 16500	---- do	Erie.
Lycoming Silica Sand Co.[1]	401 Broad St., Box 159 Montoursville, Pa. 17754	Pit	Lycoming.
Shippingport Sand & Gravel Co.	1200 Slambaugh Bldg. Youngstown, Ohio 44501	Pit	Armstrong.
Warner Co.[1]	1721 Arch St. Philadelphia, Pa. 19103	Pit	Bucks.
Stone:			
G. & W. H. Corson, Inc.[7]	Plymouth Meeting, Pa. 19462	Quarry	Montgomery.
The General Crushed Stone Co.	712 Drake Bldg. Easton, Pa. 18042	---- do	Bucks, Chester, Delaware, Lancaster, Luzerne, Perry.
Glasgow Quarry, Inc	Route 2, Box 121 Glasgow, Mo. 65254	---- do	Montgomery.
Martin-Marietta Corp	11300 Rockville Pike Rockville, Md. 20852	---- do	Centre, Chester, Fayette, Northampton.
New Enterprise Stone & Lime.	New Enterprise, Pa. 16664	---- do	Bedford, Blair, Cumberland, Franklin, Huntingdon, Somerset.
Sulfur:			
Atlantic Richfield Co	3144 Passyunk Ave. Philadelphia, Pa. 19145	Plant	Philadelphia.
British Petroleum Corp., Ltd.	Box 428 Marcus Hook, Pa. 19061	---- do	Delaware.
Gulf Oil Corp	Box 7408 Philadelphia, Pa. 19101	---- do	Philadelphia.
Sun Oil Co	1608 Walnut St. Philadelphia, Pa. 19103	---- do	Delaware.
Tripoli, rottenstone:			
Keystone Filler & Manufacturing Co.	Muncy, Pa. 17756	Pit	Lycoming.
Vermiculite, exfoliated:			
Hyzer & Lewellen	Box 155 Southampton, Pa. 18966	Plant	Bucks.
W.R. Grace & Co	62 Whittemore Ave. Cambridge, Mass. 02140	---- do	Lawrence.

[1] Also stone.
[2] Also clays.
[3] Also coal.
[4] Also iron ore.
[5] Also expanded perlite.
[6] Many major oil companies operate oil refineries in Pennsylvania and several commercial directories contain lists of them.
[7] Also lime.